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ELECTRIC RAILWAY JOURNAL

Consolidation of Street Railway Journal and Electric Railway Review
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No Lack of Discussion at Wisconsin Meeting

WISCONSIN electric railway operators were jubilant over the unqualified success of their first meeting held apart from the other sections of the Wisconsin Utilities Association and attended by at least one representative from nearly every electric railway in the State. They had a right to be, for they listened to papers that would recompense any conclave of managers, superintendents and master mechanics for the time spent. The exceptional interest was partly due also to the expeditious manner in which everything was conducted, from the opening session to the final golf game. This reflects the efficient and thorough preparations made under the direction of the chairman. There was no time during which the chairman had to beg for some one to end the silence, while occasionally the floor was in considerable demand. The success of this meeting again proves the value of the comparatively small informal gathering of men all interested in the same subjects.

Burning English Coal Gives Railways New Problem

THE use of Welsh coal to help out the fuel shortage has introduced a new problem to the power departments of the Boston and New York railways. The Interborough Rapid Transit Company of New York began using this coal under a number of its boilers last week. It was found that at boiler outputs of from 200 to 225 per cent rating, the coal burned beautifully, but when it became necessary to force the boilers to from 300 to 320 per cent rating, a thick crust would form over the fuel, which checked the air supply so that the steam pressure dropped nearly 25 per cent. Boston reported the same trouble, accompanied by a reduction of steam pressure of approximately 35 per cent.

In analysis, this coal is considered of superior quality. It has approximately 14,500 B.t.u., is approximately 15 per cent volatile and is low in ash. In order to burn it satisfactorily at the higher rating, provision must be made so that there will be no crust, or else some method must be provided for breaking it when it is once formed. The present design of stokers in use do not permit of the use of slice bars, but an attempt is being made to give increased air supply. This plan was adopted after consultation with the stoker manufacturers, who advised that better results may be expected if the air openings in the tuyeres are increased in size and the air velocity decreased.

There is no doubt that if burning of English coal is to be continued a satisfactory stoker design can be worked out, but as the use of this grade of fuel may be but temporary, extensive changes are not desirable. The Interborough Rapid Transit Company has reported that it has 30,000 tons of English coal in the harbor and 150,000 tons on the way. Owing to the inability of the company to get full generating capacity from its boilers with this coal under present conditions, it has been obliged to cut its subway and elevated rush-hour service approximately 10 per cent and this has been agreed to by the New York Transit Commission. Just how long the cut in service will continue will depend entirely upon the results of the experiments now going forward as to the burning of this fuel and also the quantity of American coal that can be obtained. In the meantime it is reported that considerable English coal is coming in, though as yet no other electric railway company in New York has used it.

Improving the Availability Factor

FOR YEARS the growth of traffic on the Chicago Elevated Railroads has been almost at a standstill, while that on the Chicago Surface Lines has increased enormously. This is accounted for primarily by the high "availability factor" of the street cars, though the excellence of the surface service must be mentioned as an equally important factor. In no city in the country is the competition given to the rapid transit system so severe in point of speed as in Chicago. The street cars there are everywhere, while the rapid transit system comprises only a single line into each main section of the city. As the result, practically all the short-ride business and much long-ride traffic goes to the surface lines. To a very large degree, only the long-haul passengers living within a radius of less than a mile purchase the faster "L" service. The long rider will walk several blocks to the elevated for the time he can save in the journey and for the more pleasant ride resulting from fewer stops and higher running speed. But when he is going only a mile or two he takes the more readily available service, which is nearly always the street car. And for his long ride, if he must walk far to get the "L," he takes the near-at-hand street car, which makes almost as good time, except for occasional delay.

Hence the problem of the Chicago Elevated Railroads has been how to increase the availability of the service. This would be one of the obvious advantages, of course, of consolidating the elevated and surface systems, for then the surface lines could be utilized as feeders for the "L." Every Chicago traction study made has recommended that plan. But the two systems continue as paralleling, competing services.

Now comes a new transportation tool—the bus—that requires no structure, no track, and no overhead or third rail construction—only the investment in the vehicle itself. Imagine hundreds of lines of motor buses, branching out in both lateral directions from each of the elevated rail line trunks, virtually bringing the rapid transit railway to every important neighborhood now remote from it. That this would greatly improve the availability factor of the elevated within the eco-

nomic limits of investment seems apparent. The elevated organization has been quick to see the field of the bus as an auxiliary or feeder to the railway and is soon to start operation of three such bus lines. If these prove their value in bringing new traffic to the railway, there are actually hundreds of places in Chicago where they can be installed by the elevated company with equal profit.

Such extension of the service of the elevated railway should normally carry with it some added charge. But under the competitive conditions existing in Chicago, with a fare differential already present of 1⅔ to 3 cents in favor of the street car, it is probably impractical to charge for a transfer between bus and "L." The plan will be to issue free transfers, and dependence for more profit will have to be placed on the fact that considerable increase in volume of traffic can be handled on the railroad at a very small additional operating expense and without increase of fixed charges, taxes and overhead expense. Here is a fundamental and most interesting development in the urban transportation art in this country.

Chicagoans to Ride on Weekly Pass

WITH the proposed inauguration on Sept. 18 of a $1.25 unlimited-ride, transferable weekly pass on the Chicago Elevated Railroads, this blanket form of transportation will receive a trial on the rapid transit lines of the second largest city of America. Readers of this journal are, of course, familiar with the development of the idea in this country, through the publication of numerous articles on installations and results. At this time some fifteen cities in the United States and Canada have adopted the transferable weekly pass, following the pioneer installation at Racine, Wis., in August, 1919.

At first it seemed as if this pass would not find much attraction with operators or public in cities larger than 100,000—in other words, in communities too large for any extensive development of the home-to-lunch riding, which seemed to be the chief value of the pass. However, the experience of the Youngstown Municipal Railway, serving a community of 175,000 persons, not only showed the pass to be an effective eliminator of individually owned jitneys but also a powerful encourager of luncheon riding by all those within reasonable riding distance from their homes.

In taking the jump from Youngstown to Chicago, it is obvious that riding home for lunch will be a very small factor in a metropolitan city. To offset this is the condition that many thousands of Chicago's workers —such as the office men of the big factories—are within 1 to 3 miles of good restaurants. With the pass in their possession, there seems no question that they will gradually get the habit of riding down to the Loop or to some local center in the opposite direction, either for lunch or for a bit of shopping. Another important point is that the great diversity of instruction and entertainment in a large city like Chicago offers many incentives to riding. The student has a variety of night and day schools; the grown-up has his lodges, night shops, social obligations, etc.; and, of course, all ages are keen for amusements on holidays and evenings. The man who uses the "L" regularly for his home-to-office, long-distance riding will be strongly inclined to walk an extra few blocks to use the "L" for his short riding, if he has a pass that entitles him to a "free" ride. Likely enough he will have a companion or two who will also be induced to use the route the passholder desires. This will seemingly mean that the "L" will secure more short-haul passengers and derive a little more revenue from each of those who buy passes. The latter will use the service more at a lower cost per ride.

The bugaboo that an unlimited-ride, transferable weekly pass means unlimited riding has long been dispelled by the experience of pass users, both here and abroad. European experience with monthly and longer-period personal passes has shown that the holder does not tend to average more than four rides a day. The same general average has been found to hold true on American installations with bearer passes, the higher figures being found in smaller cities because of the immediate large increase in mid-day riding. In the case of a small city, these four rides a day are nearly always between the same or practically the same points, because nearly all the shopping, business and amusement activities are within a few blocks of each other.

In the case of Chicago, it is not to be expected that this will be so. The average length of ride is much too long to be taken four times a day and there would be no possibility of repeating the rush-hour pair of rides in any event. The most likely development is that the extra mid-day, holiday and evening rides will be but one-fourth to one-half the length of the rush-hour rides. In going to work, the passholder will take his usual long trip to the Loop or beyond it. In going to shop or play, the passholder will usually go to one of the great neighborhood centers which have grown up in Chicago within 1 to 3 miles or so from his home. Therefore, should the number of rides per pass per diem be as high as four or more, it would not follow at all that the doubling of trips had doubled the passenger mileage.

In putting on the pass, President Budd is embarking on a courageous adventure in gaining more good will from the public, aside from getting his patrons to think along the correct merchandising lines of "a wholesale rate for wholesale use." Therefore, whether the pass proves profitable or not, the management deserves praise for making it possible for its regular riders to get the maximum amount of service with the minimum amount of trouble and low cost per ride.

Disorder and Dynamite in a Failing Cause

AN ATTEMPT at murder was made at Buffalo a few days ago. As a result a score of people are in the hospitals. Reference is made to the derailing by dynamite of a train of the International Railway, the employees of which are on strike. The strikers and their sympathizers may not have had anything to do with causing the wreck, but suspicion points their way. It is not the first act of violence in connection with the strike, but it is by far the most appalling in its consequences to the public. Already a reward of $10,000 has been offered for the apprehension and conviction of those who had a hand in causing the derailment. It was a dastardly deed, the wrecking of this train of excursionists. The Mitten management, which runs the road, has been accused by the men on strike of being a benevolent despotism. However that may be, there are worse things than life under a benevolent despotism. And one of these is life under a despotism of disorder and dynamite.

The Butt-Weld Process of Rail Joinery

During Past Two and One-Half Years 1,000 Joints Made Under the Jacobs Patents Have Been Under Observation in Regular Service— They Appear to Be Giving Excellent Satisfaction

AT THE Quebec meeting of the Canadian Electric Railway Association, held June 1 to 3, 1922, a paper on welded rail joints was read by E. B. Entwisle, chief engineer Lorain Steel Company. In his paper* Mr. Entwisle gave a brief account of the new butt-weld joint which is being developed by his company under the Jacobs patents. Since the meeting Mr. Entwisle and his associates have furnished additional information as follows:

The Lorain Steel Company purchased the patents of Charles F. Jacobs in April, 1917, but owing to the war and the fact that considerable experimental work was required to make his process commercially practicable, active work was not begun until several years later. Most street railway men are familiar with the electrically welded bar joint which this company has been applying during the past twenty-five years, which process has still a wide field of application not only in the rehabilitation of old track but also in the welding of new rails where conditions make it desirable to lay the track in advance of welding the joints. Practically a million of these joints are now in use.

The butt-weld process consists essentially in heating the ends, or abutting surfaces, of the rails to be joined, by having them in contact with a liquid flux which is heated above the welding point of steel by the passage of a comparatively small electric current. When the rail ends have reached a welding heat, they are forced together by means of a powerful clamp.

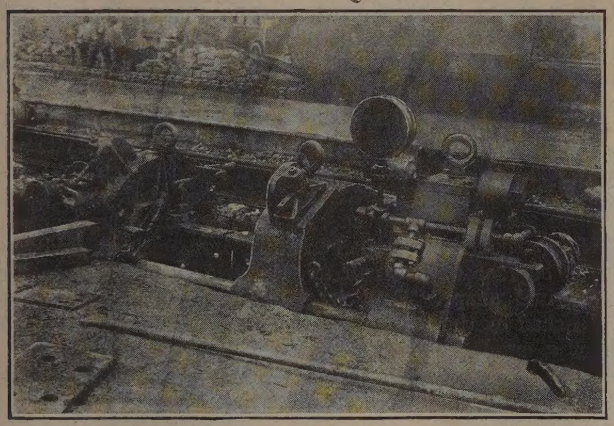
The apparatus is mounted on two trolley cars, the first containing a 30-kw. motor-driven alternating-current generator, a motor-driven air compressor and a furnace for melting the flux. In addition this car carries the two rail clamps from job to job. At the rear of this car is a reheating torch attached by air and fuel hose. The car also contains tanks for fuel oil and compressed air used for operating the melting furnace and reheating torches, and a switchboard.

*See issue of this paper for June 10, 1922, page 940.

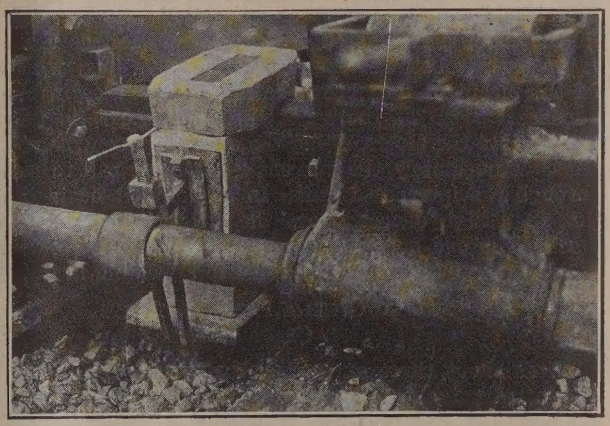
The second car carries on its front end a grinding machine for restoring the head and groove of the rail to original shape after the weld has been made. Inside this car is a molding bench where clay molds for holding flux around the rail end are made, and there is a bake oven here also for drying the molds.

How the Joint Is Made

In the application of the process the rails are placed on the ties and spiked to a few ties only, sufficient to hold the rails to gage. If the bed is very uneven, sufficient ballast is thrown in so that a fair line and surface can be obtained. The first rails to be joined are left with an opening between them of about ½ in. Subsequent rails can be laid tight.



THIS CLAMP HAS NOT YET BEEN WEDGED TO THE RAIL. A WEDGE BLOCK APPEARS AT LEFT

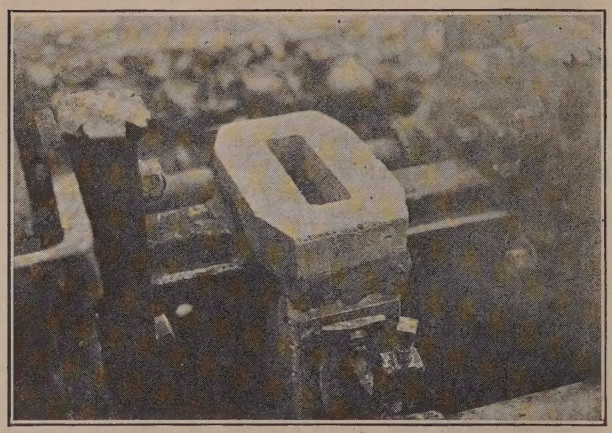


THE MOLDS ARE IN PLACE BUT STILL NEED TO BE SEALED WITH WET CLAY

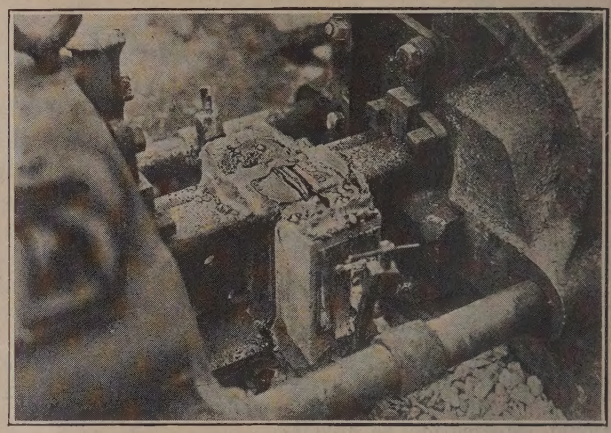
The rail clamp is then brought into position over the joint and two crossheads or yokes are securely fastened to each rail by means of wedge-shaped filler blocks which have a bearing against the web of the rail and fill the fishing spaces, thus automatically bringing the two rails into line with each other. A spacer is then inserted between the rail ends and a pressure of 5,000 lb. per square inch is applied to force the rails together. This is done by means of hydraulic pumps acting on two rams that engage the middle or sliding crosshead, the casting carrying the rams being secured to the other crosshead by means of the two side rods. The full pressure is applied before the molds are set in place to insure that the rails do not slip in the crossheads and that these will carry the rails with them when pressure is applied in making the welds. The pressure is then released and the spacer is withdrawn.

Four molds are next set around the rail ends, the opening in them forming a receptacle for containing the flux. The molds inclose the rails on all sides, so that only the end surfaces of the latter are exposed to the action of the flux. The opening in the top mold is made wider to form a reservoir.

After the molds have been put into position and the



THE MOLDS SET AROUND THE RAIL ENDS ARE NOW READY FOR THE MOLTEN FLUX



THE WELD HAS BEEN MADE AND THE TOP MOLD REMOVED. HAMMERING COMES NEXT

joints between them and the rails have been closed by means of wet clay to prevent leakage, the cable terminals from the generator are clamped on to the crossheads and the generator is excited. As one side of the clamp is insulated, no current passes, as there is no contact between the two rails. The flux, which in the meantime has been heating in crucibles in the furnace carried at the front end of the car, is now poured into the molds, filling the space between the rail ends. Immediately the current flows from rail to rail through the interposed flux. In so doing it heats the flux to a high degree above the welding heat of the steel. The end surfaces of the rail, being in contact with the hot flux, themselves come to a welding heat.

HAMMERING GIVES A FORGING FINISH TO THE OPERATION

After about three and one-half minutes, for a 9-in. 141-lb. rail, the rail ends have come to the required temperature and pressure is applied. The rails are forced together and simultaneously the current is cut off. About a half minute before a welding heat is reached, the current reaches its maximum value of approximately 1,650 amp. This requires about 40 volts.

Immediately after pressure is applied the top mold is knocked off and the heated portion of the rail across the head is hammered, thus producing a forging effect. The pressure is maintained until the rail has cooled below its critical temperature, when the other molds are knocked off and the clamps are released.

The pressure upsets each rail about $\frac{5}{16}$ in., so that it is shortened about $\frac{5}{8}$ in. in the process of welding. The upset forms a "flash" about $\frac{3}{4}$ in. wide down the web and around the foot of the rail. Across the head the upset is somewhat wider due to the greater width of the opening in the top mold.

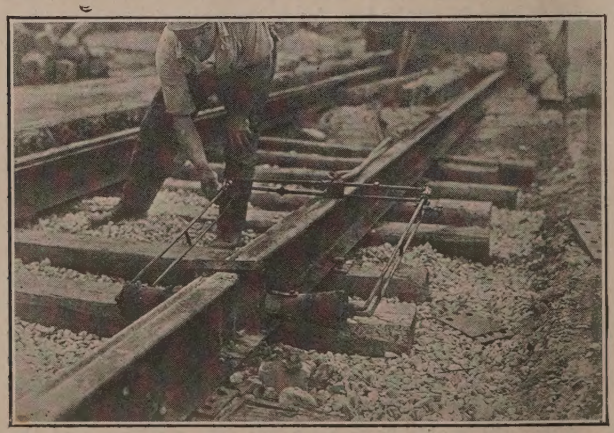
After the welding car has passed over the weld, the reheating torches are applied to reheat the web of the rail at the weld. The flame is directed to the center of the web, directly over the weld, and the web is reheated to about 1,500 deg. F., or just above the critical temperature. This relieves any stresses that may have been set up due to the end pressure or other causes. The grinder car is then brought into position and the top surface of the rail at the weld is restored to its original shape. Any irregularities which cannot be reached by the machine grinder are afterward removed by a small hand grinder.

As a continuous process, from two to two and one-half joints are welded each hour.

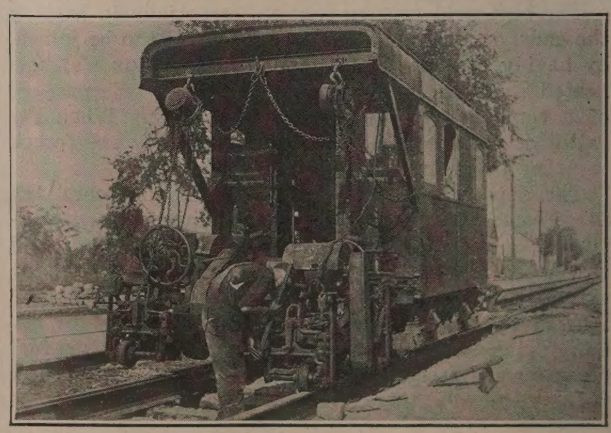
WHERE THE JOINTS HAVE BEEN INSTALLED

The first experimental installation of the process was made on Frankstown Avenue, East Liberty, Pa., on the tracks of the Pittsburgh Railways, in November and December, 1919. At first only 1,500 lb. pressure was used, but experience shows this to be insufficient and the pressure was gradually increased to 5,000 lb. per square inch.

In the early months of the experiment, difficulties were encountered due to a horizontal fracture that developed across the weld in the web, indicating a stress



THE WEB OF THE RAIL NOW REQUIRES REHEATING BY MEANS OF REHEATING TORCHES



THE GRINDING MACHINE RESTORES THE RAIL CONTOUR AT THE JOINT

tending to separate the head from the foot of the rail. This difficulty was finally removed by reheating. At first, also, chill plates were used to prevent overheating of the web, but experiments at Johnstown during the winter of 1920 and 1921 showed that chill plates could be entirely dispensed with by changing the mold so as to restrict the flux more nearly to the shape of the rail section.

Experiments also showed that not only is the reheating beneficial immediately after a weld has been made, but it can be applied to old joints also. In every case it was demonstrated beyond doubt that, by reheating, the stresses are entirely relieved and nothing is to be feared from this source if the work has been properly done. Fracturing in the web was confined entirely to the 9-in. rails with their thin wide web, and in no cases were rails of 7 in. in height or less fractured. However, in practice all welds are reheated.

During the summer of 1921 butt welds were installed as follows:

Johnstown, Pa., on the tracks of the Johnstown Traction Company. Ninety-three welds on 134-lb. 9-in. rails. Two continuous rails were produced, each 2,700 ft. long. There have been no broken welds or other fractures on this work.

Boston, Mass., on the surface tracks of the Boston Elevated Railway. Two hundred and seventy-five welds on 122-lb. 7-in. girder rails, 118 welds on 100-lb. A. R. A. standard tee rail, ninety-four welds on 134-lb. 9-in. girder rail, and twenty-seven welds on 124-lb. narrow-groove 9-in. girder rail, a total of 504 welds. One weld on the 134-lb. 9-in. girder rail parted before the job was completed, due to insufficient heating.

Philadelphia, Pa., Philadelphia Rapid Transit Company. Nine hundred* welds on 144-lb. 9-in. girder rail. In Philadelphia the rails were welded on the side of the street before they were placed in the track, the welding apparatus being mounted on a motor truck. Sections from 600 to 900 ft. long were welded and afterward rolled over into position.

Some of the track welded in Johnstown was on curves of long radius. In such cases the rail to be welded was laid out straight ahead of the one to which it was to be joined. The weld was then made, after which the rail was sprung to the required curvature, the bend at the weld being accomplished the same as elsewhere along the rail without any indication of the location of the welds in the finished curves. In Boston, curves in which the rails had previously been bent to the proper radius were welded without any difficulty.

Outing Days by Trolley

"OUTING Days by Trolley" is the kind of publicity folder that makes you want to go. And in the last analysis that is saying that it is the highest form of advertising, for the principles which the ad writer keeps always in mind are: (1) Attract attention; (2) sustain the interest; (3) compel action. W. P. Strandborg, publicity agent of the Portland Railway, Light & Power Company, Portland, Ore., has done all three. Page one lists as attractions along the company's lines picnicking, camping, dancing, bathing, fishing and hiking, with a thought thrown in about chicken dinners. Best of all, the intending excursionist after having all these attractions called to his attention is told on page ten, the last page of the folder, that there are reduced round-trip rates, good Sundays only, to Ostacada at $1 and to Bull Run and Dodge Park at 75 cents.

*The number will be one thousand by the end of this season.

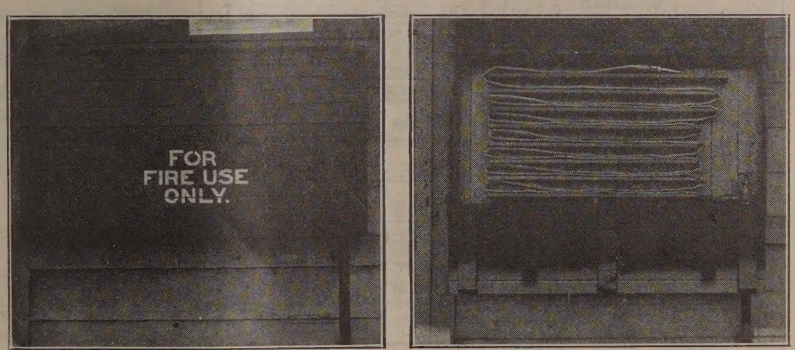
Pacific Electric Standardizes Fire-Fighting Apparatus

Employees at the Company's Stations Are Provided with Simple Equipment for Combating Incipient Fires and Holding Other Fires in Check Until Assistance Arrives

BY CLIFFORD A. ELLIOTT
Cost Engineer, Engineering Department, Pacific Electric Railway, Los Angeles, Cal.

RECENTLY the Pacific Electric Railway has been making an extensive campaign to reduce fire hazards throughout the property. A feature was the more complete standardization of fire-fighting equipment at stations.

Among the features of the standardization was the placing on each freight platform of several water barrels supplied with fire buckets. Also, inside each freight warehouse two 2½ gal. chemical portable fire extinguishers were placed.



HOSE CABINET PLACED OUTSIDE OF STATION OF PACIFIC ELECTRIC RAILWAY AS PART OF FIRE-FIGHTING CAMPAIGN

On each of two sides of the station building a newly adopted type of fire-hose case has been installed. The case is of pine, 5 ft. long, 33 in. high and 8 in. deep at the bottom and 5¾ in. deep at the top, over all. Inside are eight wood hose shelves, giving a capacity for 75 ft. of 1½-in. fire hose. The cases are painted red and lettered: "For Fire Use Only."

The case is provided with two doors hinged respectively at top and bottom. It is sealed when not in use for fire purposes. A hydrant projects through a hole in the bottom of the case, the valve being inside and hence protected from interference. The hose is permanently attached to the hydrant.

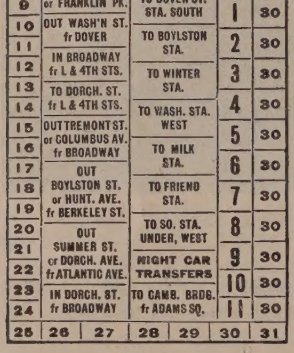
Each station is also equipped with a ladder which remains outside the building. Of course, this ladder, as well as the hose and any other fire equipment left outside the building, is liable to be stolen. However, during three years there has been little if any loss of such equipment by theft, and it is felt that the slight risk in this direction is more than offset by the insurance against the spread of fire which this arrangement provides.

Boston Tries New Transfer

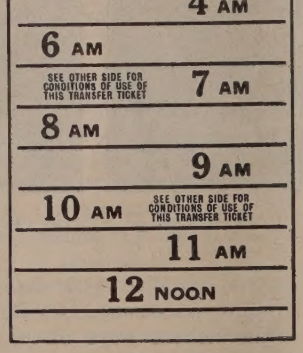
It Dispenses with the Need for Being Punched When Issued—Through Its Use the Number of Transfers Issued Has Been Reduced 25 per Cent

FOR many years there was a constant increase in the number of transfers required on the Boston Elevated system, and at one time the number of transfers issued daily amounted to nearly 200,000. The introduction of rapid transit service on elevated and subway lines with a number of inclosed transfer areas considerably changed the former transfer arrangements, so that now the number of paper transfer stations is about eighty-six and the number of transfers issued daily is about 150,000.

Until 1921 no essential change was made in the form


SEE OTHER SIDE FOR CONDITIONS OF USE OF THIS TRANSFER TICKET.
Form 514-B North Point
CLOSING RECORD
OPENING RECORD
255001
EMERGENCY OUT
EMERGENCY IN
JAN FEB MAR APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC 1 2 3 24 25 26 27
TO WASHINGTON ST. fr UPHAMS COR.
TO GENEVA AVE. fr UPHAMS COR.
OUT STOUGHTON ST. fr UPHAMS COR.
OUT fr UPHAMS COR. or FRANKLIN PK.
OUT WASH'N ST. fr DOVER
IN BROADWAY fr L & 4TH STS.
TO DORCH. ST. fr L & 4TH STS.
OUT TREMONT ST. or COLUMBUS AV. fr BROADWAY
OUT BOYLSTON ST. or HUNT. AVE. fr BERKELEY ST.
OUT SUMMER ST. or DORCH. AVE. fr ATLANTIC AVE.
IN DORCH. ST. fr BROADWAY
OUT 8TH ST. fr DORCH. ST.
WEST ON DORCH. ST. fr 8TH ST.
OUT WASH'N ST. fr BROADWAY
EAST ON BROADWAY fr WASHINGTON
OUT TREMONT ST. fr DOVER
TO SO. STA. ELEV. SOUTH
TO N'HAMPTON STA. SOUTH
TO HAYMARKET STA. SOUTH
TO DOVER ST. STA. SOUTH
TO BOYLSTON STA.
TO WINTER STA.
TO WASH. STA. WEST
TO MILK STA.
TO FRIEND STA.
TO SO. STA. UNDER, WEST
NIGHT CAR TRANSFERS
TO CAMB. BRDG. fr ADAMS SQ.
A. M. 12 1 2 3 4 5 6 7 8 9 10 11
P. M. 12 1 2 3 4 5 6 7 8 9 10 11
26 27 28 29 30 31

OLD TRANSFER



PROPOSED TRANSFER

of transfer tickets used in Boston. The present practice is for each conductor to carry two forms very much alike in arrangement except that they are different colors; one contains the inbound destinations and the other the outbound. It was found impracticable to combine these two tickets. One of these transfers is reproduced.

These transfers are punched by the issuing conductor to show the month, day, point and direction and time limit of the transfer. This requires four punches, as the point and direction are indicated by one punch. The day of the month can be punched before the car leaves the carhouse, but at the time of its issue the transfer has to have two punches, namely, point and direction and time.

During recent years, the seating capacity of the two-man cars used in Boston has increased from thirty-six to sixty-eight. This has meant a corresponding increase of transfers issued per car and a greater need of simplification of transfers.

Some time ago the management began to study the situation carefully, and at present a test is being made on certain lines with the form shown herewith at the right. In this transfer the line punched is the starting point of the car, not the point at which the passenger changes cars, and the transfer is good at any regular transfer point in any direction except for return to the point punched.

The time on this new transfer is indicated by coupons, the time limit being hourly. The transfer is stapled at the bottom and the conductor issuing the transfer tears it off at the proper line and leaves on the stub the remainder of the ticket.

The month is printed in large type on the face of the ticket and the day of the month is punched with a "V" punch before the transfer is issued to the conductor. Before starting on his trip, the conductor punches the starting point, so that when he issues the ticket to a passenger he has only to tear off the ticket at the proper point to have it properly time-limited.

Separate transfers are printed for the morning and afternoon. To help make the day of the month more distinct the ticket used during the first part of the month shows the days from the first to the sixteenth and that portion which is used during the last part of the month contains the numbers from seventeen to thirty-one.

The introduction of this ticket has proceeded from carhouse to carhouse and thus far it has proved satisfactory. Its basic idea was suggested by the general auditor of the company, and it had an intensive study by the transportation officials and the conductors before it was put in trial service.

New Track Costs $7 per Foot

L. ALLBRITTON, general manager Wichita Falls (Tex.) Traction Company, is enthusiastic regarding a track construction job completed some months ago in which the cost of a 3,700-ft. job, including the excavation through the paving and everything except overhead, was $6.98 per lineal foot. This work was done in building a new line of track for the purpose of making a cut-off in one of the divisions and saving more than a half mile. This was necessary in carrying out a rerouting program.

The new track was put in a street paved with solid concrete. A strip was broken out of the center, 6 ft. 10 in. wide, and excavated to a depth of 14 in. Dayton mechanical ties were used with 75-lb. standard A. S. C. E. T-rail. The special trackwork contained 120-lb. rail. The ties were placed on 3-ft. centers and were imbedded in 1:2:4 concrete, made with screened sand and hard limestone rock. The concrete was covered with about 4 in. of soil and allowed to stand for twenty-eight days before operation began.

All joints were electrically seam welded, using Indianapolis Switch & Frog Company "Apex" joint bars and a resistance type welder. Three pounds of welding steel were used on each joint.

Mr. Allbritton says of this track: "There is no doubt in my mind but that we have a piece of track that will be good for the entire life of the rail. The resiliency we obtain from these ties will more than pay for their cost. Churches and residents along this route have complimented us very highly on the seeming smoothness and quiet running of the cars over this track."

Effect of Peak Loads on Railway Motors

Care Should Be Used in Overloading Ventilated Motors Through Trailer Hauling, as They Are Not Able to Carry as Heavy Loads in Proportion to Their Continuous Rating as Non-Ventilated Motors

BY G. M. WOODS
Railway Engineer, Westinghouse Electric & Manufacturing Company

THE present general adoption of train operation, either multiple unit or motor car and trailer, has resulted in the recognition of certain factors not previously given sufficient consideration. In the choice of a type of train, it is well known that certain conditions of grade or heavy snows may make trailer operation undesirable. It may be impracticable to provide motors sufficiently large for trailer hauling and have satisfactory clearance under the motor and gear case when wheels of 26-in. diameter are used. The smoother operation of multiple-unit trains in starting and stopping may make them preferable to trains composed of motor cars and trailers. In many instances the cost of operation for motor cars and trailers may be higher than for multiple-unit trains because the motors of the cars intended for trailer hauling must be uneconomically large and of too high speed for single car operation. A greater percentage of spare cars must also be provided when trailers are hauled, for trouble with the motor car ties up both cars of the train.

The heating effect of short time overloads on railway motors, especially when ventilated motors are used, has been given considerable study in the past few years. It is generally recognized that ventilated motors are less able to carry as heavy loads in proportion to their continuous ratings as non-ventilated motors, and greater care must be exercised in imposing such loads as trailer hauling. While the average load may be well within the motor's capacity, serious overheating frequently results from overloads of short duration. Recent investigations show also that many non-ventilated motors, which have been used for trailer hauling for several years, are subjected to such severe overloads that very high motor maintenance either now exists or may be expected. In some instances the present overloading is due largely to the fact that changed traffic conditions have necessitated increases in schedule speeds. The high maintenance has been accepted as a necessary evil brought on by new requirements, but in the purchase of new equipments the present overloading would be avoided either by the purchase of larger motors or by buying cars equipped for multiple-unit operation.

Even when the heating of the motor remains within safe limits, heavy peak currents may be drawn which will cause serious motor trouble other than roasting of insulation. The brush-holder contact hammers and shunts become heavily loaded and an appreciable current flows between the brushes and brush box sides, and through the springs. The springs may become overheated with consequent loss of tension. At extremely high currents the motor field iron becomes saturated and the field strength remains the same, while the armature reaction increases almost directly as the current. All of these conditions tend to induce flashing of motors.

The flow of current between brushes and brush boxes causes burning of the brushes and increases side wear. The brush boxes also become rough and the wear of carbons is further accelerated. The carbons become loose in the boxes and poor commutation follows. Heavy currents of such short duration that no overheating of windings results may cause hot spots on the commutator which develop into flat spots. Flat spots constitute one of the most common causes of poor commutation and flashing.

While hot banding of armatures, dipping and baking, and other methods of modern motor manufacture tend to produce a substantial mechanical structure, an electrical winding is inherently semi-flexible, for the fits obtained in the joining of entirely metallic parts cannot be attained when insulated wires enter the construction. A railway motor winding is free to move a certain amount when subjected to vibration or the mechanical stresses set up by heavy currents. The stresses in the windings increase as the current increases, but at a varying rate depending on the degree of magnetic saturation. The stresses in the windings at low magnetic densities are nearly proportional to the square of the current, and after saturation is reached, are approximately directly proportional to the current. Motor field coils are frequently so greatly distorted by the rush of current due to flashing that they have to be removed and are of scrap value only. Tests show that the armature windings of railway motors move in the slots when heavy currents are applied.

REWINDING OFTEN DISCLOSES DEFECTS

There have been numerous examples of railway motors operating fairly successfully for years with temperature rises much higher than ordinarily regarded as permissible. Whenever occasional rewinds were necessary, the insulation was found in a seriously deteriorated condition; but because of the absence of electrical and mechanical shocks, failures were infrequent.

An example of failures being caused by vibration after certain motors had been overloaded in other service is of particular interest because of the absence of overloading during the period immediately preceding the failures. A number of motors were worked rather close to their capacity in frequent-stop city service for a number of years with entirely satisfactory results. The motors were then changed to suburban service of much easier character so far as heating conditions were concerned, but of such a character that shocks and vibration were more severe. There were a number of failures of armatures shortly after the motors went into the new service. Investigation showed the insulation to be in a dry, lifeless state as a result of former overheating, although the motors were operated far under their capacity in the suburban service. After the motors were rewound, however, they again operated with very low maintenance.

The setting of circuit breakers and overload trips should be based on a motor's capacity and commutating

limits and so far as motor performance is concerned should be unaffected by service conditions. The manufacturers of electrical equipment are sometimes asked for an overload protection device which can be set at a certain value for single car operation and readily changed to a higher value when trailers are hauled. It is desired to have the proper overload protection of the motors when single cars are operated but the requirements of trailer operation make it necessary to sacrifice some of the protection. In other instances recommendations of a "new" circuit breaker setting are requested so that the frequent tripping of breakers when trailers are hauled can be eliminated. Increased maintenance of motors may surely be expected as a result of increased breaker setting.

A few years ago the performance of some quadruple equipments of 50-hp. motors used for hauling trailers was investigated. The equipments originally were rather liberally applied to cars weighing 46,000 lb., and trailer hauling was not considered at the time the equipments were purchased. Later developments made train operation desirable and the use of the excess capacity of the 50-hp. motors to haul trailers one and one-quarter hours in the morning and an equal period in the afternoon apparently offered the cheapest solution to the problem. Tests showed that the temperature rise of the motors was well within safe limits under the conditions of operation. They also indicated, however, that the motors were subjected to heavy peak currents during the period of trailer hauling. With rush hour loads the tons per motor were increased 70 per cent. In spite of the lower accelerating rate of motor car and trailer the average accelerating current was increased from 71 amp. to 94. Under one severe condition of grade and acceleration, a peak load of 200 amp. per motor was observed. This current is 270 per cent of the one-hour rating of the motor. Under the same conditions of grade and acceleration, the motor current for motor car would have been only 125 amp., which is 170 per cent of the motor's one-hour rating. Motor maintenance increased greatly after trailers were hauled, although failures traceable to overheating were rare.

Experience shows that it is not sound engineering practice to assume that a certain motor equipment will be satisfactory for trailer hauling simply because motor temperatures are observed and found to be within safe limits. A number of the most perplexing troubles encountered in railway motor operation are undoubtedly caused by peak loads of such short duration that their heating effect is negligible. Trailer hauling, especially with equipments not correctly applied for such service, is one of the most fruitful sources of excessive loads.

Blight-Infected Chestnut as Durable as Sound Chestnut

SERVICE records collected by the U. S. Forest Service indicate that chestnut posts, poles and ties cut from blight-infected trees are as durable in service as similar timbers cut from healthy trees. Inspections on posts in one locality during eight years of service showed that decay progresses about as rapidly in one as in the other. The blight fungus in a living tree grows in the bark, but it does not penetrate deeply into the wood itself. Blight-killed chestnut should be cut and utilized as soon as possible. Allowing dead trees to check and become infected with decay in the woods shortens the service life of timbers cut from the tree.

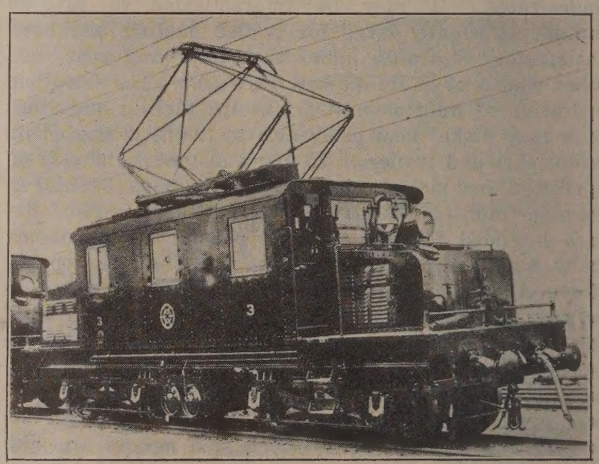
Electrification of Chichibu Railway

Japanese Railway Adopts New Form of Motive Power and Secures Equipment of American Make—The Mileage Affected Is Thirty-five

BY D. E. RENSHAW
Railway Equipment Engineering Department
Westinghouse Electric & Manufacturing Company

ONE of the first roads in Japan to install through electric service over its entire route is the Chichibu Railway, which covers approximately 35 route-miles from Kumagaya through Kagemori Kumagaya, the lower terminal, is a junction point with the Takasaki Line of the Imperial Government Railways which extend to Tokyo.

The chief source of revenue for the Chichibu Railways is Mount Buko, near Kagemori. This mountain is 4,500 ft. in height, and contains great deposits of lime-



AMERICAN-BUILT LOCOMOTIVE FOR USE ON JAPANESE RAILWAY NOW BEING ELECTRIFIED

stone, some fine decorative stone and valuable timber. Approximately 300 tons of limestone are carried each day from Mount Buko to Kumagaya, whence it is routed over the government lines to the Asano cement mills in the suburbs of Tokyo. In addition lesser amounts of other materials are carried. The up grade traffic is very light.

Five trains are run each way per day, each train being made up of fourteen freight cars, weighing 12

DATA FOR LOCOMOTIVES FOR CHICHIBU RAILWAYS

Dimensions	
Track gage	42 in.
Length over end frame	30 ft., 8 in.
Rigid wheelbase	7 ft., 4 in.
Total wheelbase	24 ft., 2 in.
Width over all	8 ft., 4 in.
Wheel diameter	38 in.
Height of buffer centers	34½ in.
Height of roof	10 ft., 11 in.
Minimum operating height of trolley	12 ft., 9 in.
Size of journals	5 in. x 9 in.
Weights	
Mechanical parts	50,000 lb.
Air brake	3,600 lb.
Electrical equipment	28,400 lb.
Total locomotive	82,000 lb.
Per axle	20,600 lb.

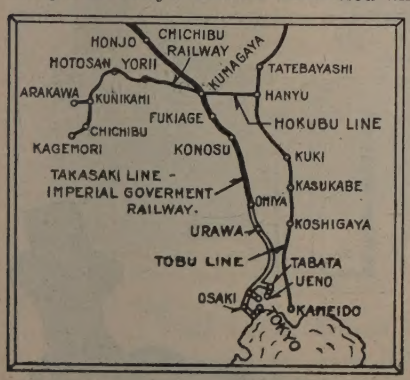
metric tons each, and four passenger cars of 9 metric tons each. Passenger traffic is very heavy at certain seasons, notably in the spring when the banks of the Arakawa River are lined with cherry blossoms and in summer when numbers of people make their homes at Hotosan, a short distance below Chichibu.

The grades are rather favorable for present traffic conditions since the heaviest loads travel from Mount

Buko toward Kumagaya, approximately 1,000 ft. lower. The maximum grade is 2.5 per cent but this is only a few hundred feet in length. There also exists something more than a mile of 2 per cent grade, and over the entire route the average is 0.5 per cent. A probable future extension of the Chichibu is across the mountains to connect in again with the government lines on the west side of the slope. The line which now extends from the east coast across the island to the Japan Sea has a single-track section, through the Usii Pass, where the grade is 6.7 per cent and which contains many tunnels. This section is electrified and is operated with 42½-ton rack locomotives of German make which haul light trains at low speed. The proposed extension of the Chichibu line would contain considerable 2.5 per cent grade, but over this profile train weights and speeds could be increased and the tonnage carried would greatly relieve the congestion at Usii Pass. The loads in this case would be heavy in both directions.

The Chichibu Railway purchases its power from the Musashino Water Power Company, and converts to 1,200 volts direct current in substations located at Yorii and Chichibu. Each substation contains three Westinghouse 250-kw. rotary converters, with transforming and switching equipment to correspond. Two units are operated in series and the third unit is a spare.

The overhead is single catenary type. A 400,000-circ.mil feeder is run each way from each substation and is tied into the trolley at numerous points. Three similar additional rotaries, now on order, will be installed at Kumagaya to care for the load part way up the grade toward Yorii, and for an 8-mile extension to Hanyu. This extension is on the Hokubu Railway line, which will be operated by the Chichibu Railways, and connects the Chichibu line with the Tobu line, which parallels the government railway to Tokyo. It is planned that eventually the route from Kagemori to Hanyu to Tokyo will be electrified and operated as one system, giving a more direct route to the Asano cement mills than the present route.



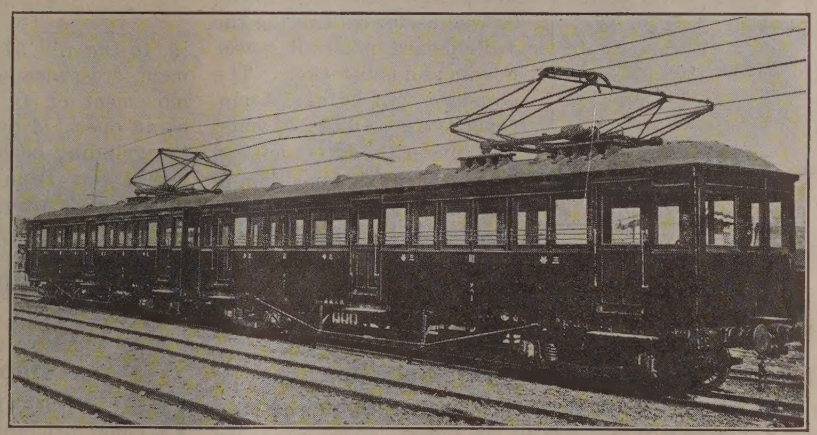
THE CHICHIBU RAILWAY, SHOWN NEAR TOP OF MAP, IS NOW BEING ELECTRIFIED

To initiate the electric operation of the Chichibu Railways, the Westinghouse Company has recently shipped motor and control equipment for three multiple-unit cars and five complete Baldwin-Westinghouse locomotives. The motor cars weigh 28.8 metric tons complete without load, and will normally carry ninety people including those standing. The four motors for each car are type 546-J rated 60 hp. each, and the control is Westinghouse type H.L. arranged for straight 1,200 volts.

The initial motor car schedule calls for five single car trips each way each day, but this will be increased or decreased at various seasons to suit the traffic by omitting one or two trips, or by coupling on regular passenger coaches as trailers. Four additional duplicate equipments are now on order, and when they are received service will be extended to Hanyu and mixed trains will be abandoned. The passenger traffic will then be taken care of by the motor cars exclusively.

The locomotives are of the Baldwin-Westinghouse standard type. They have ratings of 520 hp. at 20 m.p.h. for one hour and 408 hp. at 22.5 m.p.h. continuously, with dimensions and weights as given in the accompanying table.

Although there were no radical departures from standard construction in the locomotive mechanical parts the weight and space restrictions necessitated a very close design. The limitations of track gage, cab width and allowable roof height, together with the railway's requirements for fairly large clearances under motor and gear case, necessitated the adoption of a 38-in. diameter wheel to allow the use of a motor of the specified capacity. As compared with American practice, the locomotive was "compressed" in height, width and weight, while the power requirements were not decreased. To compensate for this the truck bolster, the cab underframing, air duct, and the brake rigging were all specially designed to obtain low headroom.



A MOTOR-CAR TRAIN ON THE CHICHIBU RAILWAY, JAPAN

The trucks are of the swivel, rigid bolster, equalized type with rolled steel bar side frames located outside the wheels. Wheels have cast-steel centers and rolled-steel tires. The draft rigging consists of hook and link-type couplers, with a take-up screw of a standard type.

The brake equipment is standard Westinghouse steam locomotive apparatus modified for electric locomotive application. It includes an independent brake for handling the locomotive alone, together with the standard quick acting automatic brake for both locomotive and train. Although the cars are not yet all provided with air brakes, it is planned so to equip them on this and other Japanese railways.

The arrangement of apparatus in the cab differs from American standard practice in only one important feature. In Japan, the engineman drives from the left-hand side of the cab. Therefore, for these locomotives, the relative positions of the master controller and brake valves are reversed as compared with American locomotives.

What's New from the Manufacturers

PORTABLE DIRECT-CURRENT TESTING METER

Portable Test Meter

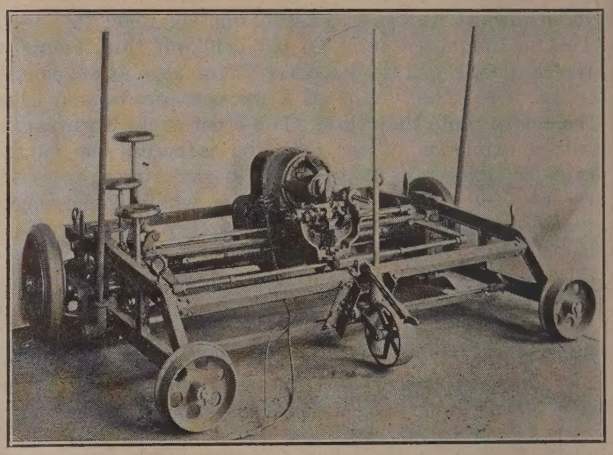
A MERCURY type of portable direct-current test meter is now being produced by the Sangamo Electric Company, Springfield, Ill. With suitable shunts and multipliers it can be readily adapted for testing purposes as well as for calibrating the switchboard meters in power houses and substations. The standard will be of 10-amp. capacity for 110 to 220 volts. The meter is fitted with a magnetic clutch for stopping and starting, and a train reset to bring the indicator back to zero.

Storage Material Crawler Crane for Handling

WHERE railway materials are stored in the open and where all parts of the yard cannot be reached readily with track, a crawler crane has been found of advantage. To meet such conditions and for other construction uses the Link Belt Company, Chicago, Ill., has just brought out such a crane. It weighs complete without bucket approximately 22 tons and has a ground pressure of 10 lb. per square inch with the caterpillar tread as furnished. The crane will lift 10 tons at a 12-ft. radius and 3 tons at a 30-ft. radius. The hoisting speed is 125 ft. per minute with a maximum rope pull of 10,000 lb. on a single line. The crane is provided with two independent band-clutch-operated hoisting drums. The crane will rotate four complete revolutions per minute, travel ¾ m.p.h. and climb a 20 per cent grade. The shoes are 18 in. wide and the over-all width of the crawler tread is 9 ft. 7 in. The total bearing area is 30 sq.ft. Power is furnished by a Climax Engineering Company's four-cylinder, 5¼-in. x 7-in. heavy-duty tractor engine.

Machine for Grinding Rails

THE accompanying illustration shows a form of track grinder being placed on the market by the A. L. Brown Company, Worcester, Mass. The machine rests upon four track wheels, and two additional rubber-tired bearer wheels are provided which may be lowered by means of a lever and toggle joint to raise the machine clear of the track. With the weight supported by the rubber-tired wheels a third bearer wheel of iron in front serves to steer the machine. The grinding head has a transverse movement of 37 in. lengthwise of the track. This movement is power driven and may be set to reverse automatically at distances of from 1 in. to the full 37 in. The grinding head has a movement crosswise of the track of 6 in. and a vertical movement of 10 in., both of these latter movements being operated by hand wheels. The slide upon which the grinding head traverses may be tilted to any angle either way from the level up to 17 deg. Lock pins in the track wheels hold the truck stationary while it is in use or upon grades. The machine is driven by a 500-volt d.c. motor through two leather link belts, provided with a guard and with swinging idlers to maintain belt tension.

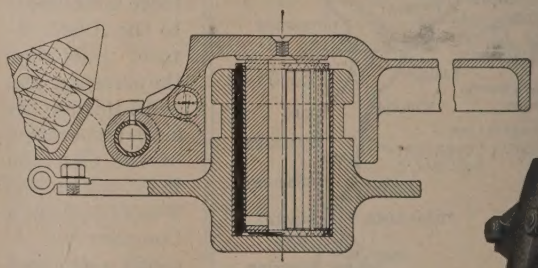


MACHINE FOR GRINDING TRACK RAILS

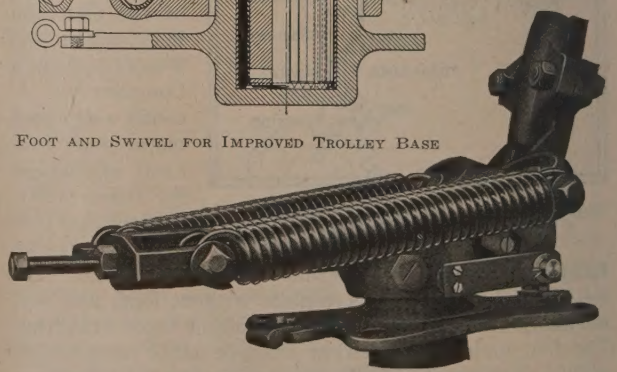
Improved Trolley Base

R. D. NUTTALL COMPANY, Pittsburgh, Pa., has just brought out a new trolley base which bears the type No. US-13-E. This is a roller bearing base and one of the distinctive features is the improved swivel arrangement, which is the reverse of other types of roller bearing bases. The swivel pin or inner race is inverted and is a part of the swivel cap, and the cap or outer race into which it is inserted is a part of the base. Some of the advantages claimed for this arrangement are that the lubricant is retained permanently and cannot run out on the car roof, and that this construction is practically dust and waterproof.

All rollers are hardened and secured in a case, which



FOOT AND SWIVEL FOR IMPROVED TROLLEY BASE



NEW TYPE TROLLEY BASE

may be readily removed and replaced as a unit. The inner and outer races are hardened and ground. A trigger lock is provided to enable the carhouse maintainer to lock the socket down in a horizontal position. This permits the changing of poles in carhouses with very low headroom.

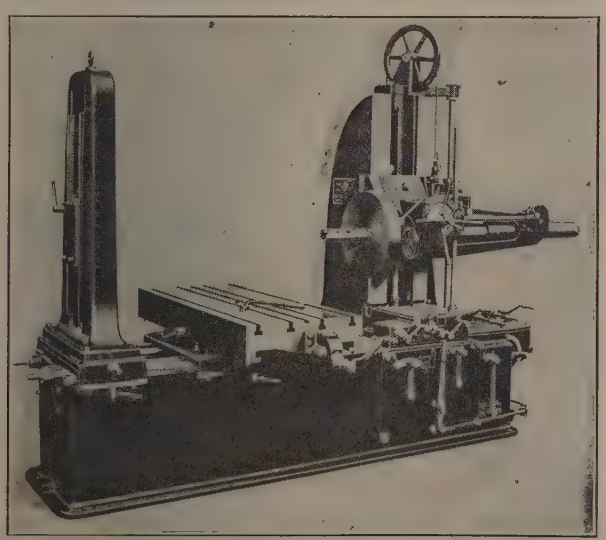
The pole socket axle pin, as well as the bearing, is hardened, and an oil hole is provided for lubrication. Two heavy bronze springs are provided for shunting the current from the pole socket to the base. A two-bolt pole socket clamp is another distinctive feature. It permits the changing of poles more quickly than where four-bolt clamps are used.

Handy Combination Machine

A NEW floor-type horizontal boring, drilling and milling machine has just been brought out by Pawling & Harnischfeger Company, Milwaukee, Wis. This machine is designated as No. 3T and some of the special features include a saddle fully counterbalanced with counterweight located inside the column, centralized control, externally and internally driven face plates, and automatic stops for saddle and platen.

The driving pulley is 14 in. in diameter for a 3-in. belt and makes 350 r.p.m., giving sixteen spindle speeds, ranging from 14½ to 225 r.p.m. with small face plate, and 8.7 to 136 r.p.m. with large face plate. Where motor drive is desired it is recommended that a 5-hp. constant-speed motor with speed about 1,200 to 1,400 r.p.m. be used.

There are eight geared feeds ranging from 0.005 to 0.288 in. per revolution of spindle for boring, and from 0.0084 to 0.44 per revolution of spindle for milling when using the small face plate. By using the large face plate the feeds range from 0.008 to 0.48 in. per revolution of spindle for boring and 0.013 to 0.73 in. per revolution of spindle for milling. The rate of feed is the same for every part to which it is applied, and not more than one feed can be engaged at the same time.

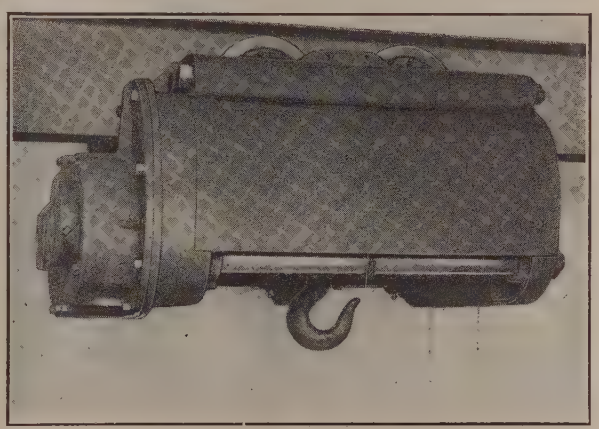


FRONT SIDE VIEW OF HORIZONTAL BORING, DRILLING AND MILLING MACHINE WITH LARGE FACE PLATE

All operating levers and hand wheels are within easy reach of the operator and conveniently arranged for the operations required. The starting, stopping, reversing and changing of feeds or speeds, fast or slow, by hand or power, are controlled by the operator, without moving from his position. The movements of all levers are interlocked so that it is impossible to have any two conflicting speeds or feeds in action at the same time.

Hoist for Short Headroom

THE Standard Electric Crane & Hoist Company of Philadelphia, Pa., has brought out a monorail electric hoist which is particularly useful in shops where headroom is restricted. This hoist requires but 14 in. of headroom, which is much less than the usual type of monorail hoist.



MONORAIL ELECTRIC HOIST FOR SHORT HEADROOM

In the construction of this hoist all shafts are of high carbon steel, heat treated and ground to size with roller bearing races pressed on the ends. The bearings are of the Hyatt high-duty type. Only plain, straight spur gears are used for the hoisting drive. The gears are of forged steel and are contained in the end housing. Pinions are of high carbon steel heat treated. The right and left-hand cable grooves of the hoisting drum coil the rope in a single layer. The cable is connected to the exterior of the drum so that it can be easily removed or replaced. The controller used with this hoist is also of a new type, built especially for hoist service. All parts are fireproof and are protected from dust and moisture. The hoisting motor is fully inclosed and is equipped with high-grade ball bearings.

The automatic mechanical lowering brake runs in an oil bath and is of the screw and disk type geared to the intermediate shaft. The automatic holding brake works on a pulley mounted on the hoisting motor shaft proper. When the load block has reached its upper limit of travel, an automatic device serves to break the electrical circuit and applies the holding brake. The hoists are built in five types, ranging in capacity from 2,000 to 10,000 lb.

New Strain Insulator

A NEW "Duro" strain insulator for insulating the trolley wire from its supports is being marketed by the Westinghouse Electric & Manufacturing Company. The insulator is designed to give the essential mechanical strength and a high flash-over voltage. A malleable-iron socket is filled with insulation in which is inserted a forged steel stud. The entire body is surrounded by molded insulation which is infusable and unaffected by ordinary temperatures. The insulation is also moisture-proof and will not shrink with age.

Electric Railway Publicity

Devoted to How to Tell the Story

Good Advertising Must Iterate and Reiterate Your Story

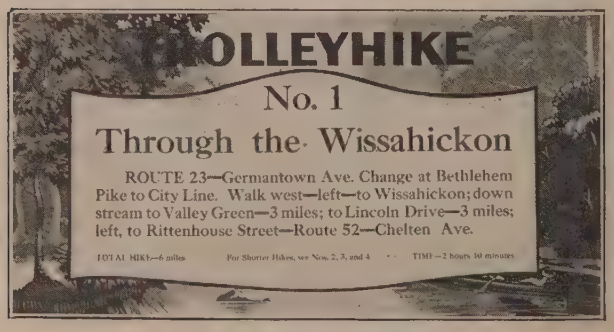
THERE are a great many theories about advertising, but one factor is common to the most diverse viewpoints, namely, that a story cannot be told too often and in too many paraphrasings. An amusing proof of this comes from Youngstown, Ohio. When the Youngstown Municipal Railway announced its unlimited-ride weekly pass, it took the publicity bull by every available horn. Newspapers, car cards, talks to interested individuals and groups—these and other means were used most freely. For all that, the meaning of the innovation did not percolate at once into the understandings of many. Thus, the initial slogan "Ride all week for $1.25" was interpreted by some to mean that the twelve a week rides they had hitherto taken would cost that sum instead of $1.08. This misconception among foreign laborers actually formed the basis of a stupid attack in a foreign weekly.

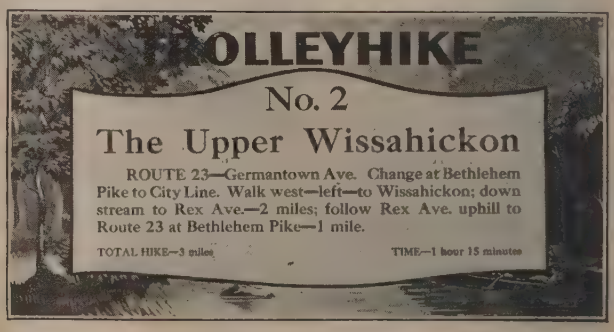
In a recent talk before the Youngstown Advertising Club, Frank Wert, director of public relations for the company, mentioned several other diverting interpretations of the pass announcements. A number of people thought that they could not buy a pass unless they sat for the company's photographer and had their picture on the ticket. Others were at a loss to understand why the management should make the pass transferable, not realizing at the moment that identification on busy city cars is out of the question and that passholders buy the pass primarily for their own use anyway. Of course the persistent reiteration of what can be done with the pass has educated the Youngstown public to understand it now even better, perhaps, than does many a professional railway man. The obvious lesson is that no matter how simple a new idea may seem to its perpetrators it must be tapped in at frequent intervals rather than hammered into the consciousness of the public at one blow.

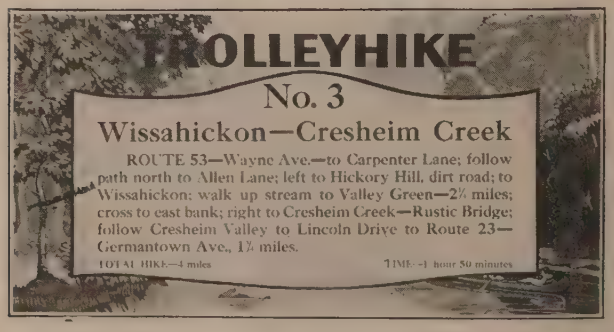
"Trolleyhikes" Popular Sport in Philadelphia

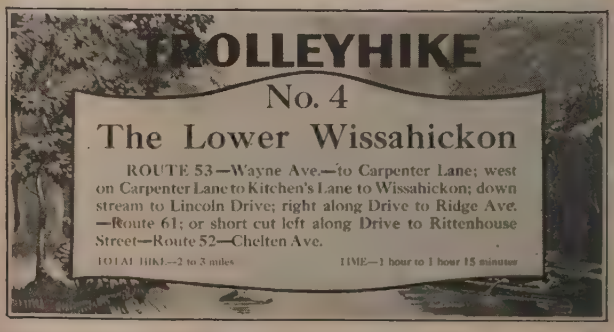
A UNIQUE and interesting campaign has been started recently by the Philadelphia (Pa.) Rapid Transit Company. It is designed to encourage people in quest of interesting walks to use the cars of the company to carry them to points from which the hikes may best begin. "Trolleyhikes," as the posters are headed which are being displayed by the company in its cars, tell their own story. In other words, trolley it before you hike it, and you will then have all the advantages of a real hike. Considerable advertising of the routes for the "trolleyhikes" has been done in the Philadelphia papers and in the company's own cars. This is a real service to the public who revel in long walks, and will also be beneficial to the railway because of the resulting increased riding. The company has already noted a considerable increase in riding on those lines feeding the walks which have been advertised.

The accompanying illustrations show the four routes already opened up leading to good hiking places. These will be followed by talks on walks through Fairmount Park and other walking country reached by the P. R. T.


TROLLEYHIKE
No. 1
Through the Wissahickon
ROUTE 23—Germantown Ave. Change at Bethlehem Pike to City Line. Walk west—left—to Wissahickon; down stream to Valley Green—3 miles; to Lincoln Drive—3 miles; left, to Rittenhouse Street—Route 52—Chelten Ave.
TOTAL HIKE—6 miles
For Shorter Hikes, see Nos. 2, 3, and 4
TIME—2 hours 30 minutes


TROLLEYHIKE
No. 2
The Upper Wissahickon
ROUTE 23—Germantown Ave. Change at Bethlehem Pike to City Line. Walk west—left—to Wissahickon; down stream to Rex Ave.—2 miles; follow Rex Ave. uphill to Route 23 at Bethlehem Pike—1 mile.
TOTAL HIKE—3 miles
TIME—1 hour 15 minutes


TROLLEYHIKE
No. 3
Wissahickon—Cresheim Creek
ROUTE 53—Wayne Ave.—to Carpenter Lane; follow path north to Allen Lane; left to Hickory Hill, dirt road; to Wissahickon; walk up stream to Valley Green—2¼ miles; cross to east bank; right to Cresheim Creek—Rustic Bridge; follow Cresheim Valley to Lincoln Drive to Route 23—Germantown Ave., 1¾ miles.
TOTAL HIKE—4 miles
TIME—1 hour 50 minutes

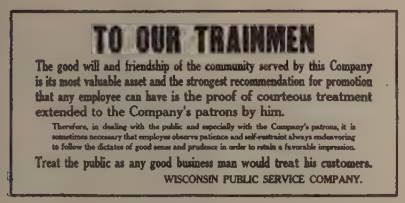

TROLLEYHIKE
No. 4
The Lower Wissahickon
ROUTE 53—Wayne Ave.—to Carpenter Lane; west on Carpenter Lane to Kitchen's Lane to Wissahickon; down stream to Lincoln Drive; right along Drive to Ridge Ave.—Route 61; or short cut left along Drive to Rittenhouse Street—Route 52—Chelten Ave.
TOTAL HIKE—2 to 3 miles
TIME—1 hour to 1 hour 15 minutes

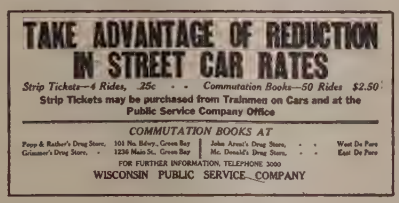
ADS THAT HAVE MADE HIKERS OF THE INDOLENT

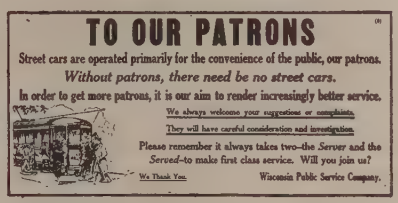
TO OUR PATRONS
The company and all our Trainmen appreciate the manner in which our patrons are assisting us in carrying out the rule,
"Passengers Will Please Deposit Exact Fare In Fare Box"
Your co-operation is also aiding us to give 100 per cent service by having
"EXACT FARE READY"
We Thank You
WISCONSIN PUBLIC SERVICE CO.

HOP-ON
We are glad to meet such a large number of our regular customers on the cars each day—
We are just as glad to see new customers on the cars, for they represent old customers in the making, provided, we treat them right and give them Real Service—
Honestly, we are trying our best to do this WINTER and SUMMER.
Our operators are equally interested in giving you the best possible service during all kinds of weather
WILL TELL YOU MORE LATER
WISCONSIN PUBLIC SERVICE COMPANY.

STREET CAR SERVICE IMPROVED
We have added four new safety cars. They are equipped with the latest improved efficient motors, air brakes, storm windows, temperature control on electric heaters, and safety devices, all of which contribute to COMFORTABLE AND RELIABLE SERVICE such as we desire to give at all times.
Success to You--1922
WISCONSIN PUBLIC SERVICE COMPANY.


TO OUR TRAINMEN
The good will and friendship of the community served by this Company is its most valuable asset and the strongest recommendation for promotion that any employee can have is the proof of courteous treatment extended to the Company's patrons by him.
Therefore, in dealing with the public and especially with the Company's patrons, it is sometimes necessary that employes observe patience and self-restraint always endeavoring to follow the dictates of good sense and prudence in order to retain a favorable impression.
Treat the public as any good business man would treat his customers.
WISCONSIN PUBLIC SERVICE COMPANY.


TAKE ADVANTAGE OF REDUCTION IN STREET CAR RATES
Strip Tickets—4 Rides, 25c
Commutation Books—50 Rides $2.50
Strip Tickets may be purchased from Trainmen on Cars and at the Public Service Company Office
COMMUTATION BOOKS AT
Popp & Rather's Drug Store, 101 No. Bdwy., Green Bay
Grimmer's Drug Store, 1226 Main St., Green Bay
John Arnn's Drug Store, West De Pere
Mc. Donald's Drug Store, East De Pere
FOR FURTHER INFORMATION TELEPHONE 3000
WISCONSIN PUBLIC SERVICE COMPANY


TO OUR PATRONS
Street cars are operated primarily for the convenience of the public, our patrons.
Without patrons, there need be no street cars.
In order to get more patrons, it is our aim to render increasingly better service.
We always welcome your suggestions or complaints.
They will have careful consideration and investigation.
Please remember it always takes two—the Server and the Served—to make first class service. Will you join us?
We Thank You.
Wisconsin Public Service Company.

GOOD-WILL CAR CARDS THAT ARE PRODUCING RESULTS

Getting the Right Spirit in Publicity

THE Wisconsin Public Service Company, Green Bay, Wis., is making use of a series of car cards placed on the two bulkheads of each car and changed bimonthly. Some of these are reproduced herewith to illustrate the success that has been attained in getting the publicity to reflect the spirit that begets good will and merchandises the service. Most of these cards have been addressed to the company's patrons, but there has been a twofold purpose. In addition to the obvious one of creating a friendly patronage, there has been the indirect purpose of inducing the trainmen and other employees to live up to these expressed policies. The card addressed to the trainmen has a dual purpose similarly, the public in this case being the indirect recipient of the message. If the editors of this paper are competent judges in such cases, they consider that the Green Bay company has succeeded in giving its publicity matter a very happy and effective treatment.

Advice to Railway Operators

AN EDITORIAL, "More About Public Relations Work," in the *Railway Age* for May 20, although addressed to steam railway executives, contains sound advice to electric railway operators. That paper said in part:

The railways are fully and admirably equipped to present their case to law makers, commissions and courts. But law makers, commissions and courts are not going to settle the future of the railways. They are merely agents—the public is their principal. In this, as in other affairs, the principal will in the long run determine the policies carried out by the agents.

Is it not a curious thing that so many railways—practically every railway in fact—should recognize the need for employing men of great ability to represent them before legislative committees, commissions and courts, and that so few should recognize the need for employing men of equal rank and ability to represent them before the public? Let us be frank about it. Is it not a fact that most railway managements so greatly underestimate the importance of effective public relations work that they would think a man was a little crazy who should suggest that each large road should have in charge of its public relations work a man as highly paid and as able as those at the head of its legal, operating, traffic and accounting departments? But has not the problem of establishing satisfactory relations between the railways and the public been proved by the experience of many years to be quite as difficult as any other problem confronting railroad managements? Is it not at least as far from solution as any other big problem of railroad management? The answers to these questions are obvious. If the problem presented by public relations is so big, so difficult and so far from solution, how can it be expected it will ever be solved unless by men who are able in proportion to the bigness of the problem and who can devote their time to it?

Key Route Campaigns Against Auto

AS A MEANS of increasing travel on the cars in winter time, the San Francisco & Oakland Terminal Railways, Oakland, Cal., is using posters printed in large type which are pasted on the car windows. One or two posters are placed in each car, according to the size of the equipment, on the side nearer the sidewalk. The appeal of the posters is made through the fact, particularly well known to the motorist, that it costs from 5 to 18 cents per mile to operate an automobile and that this is expensive means of travel for riding into the business district to work or to do light shopping. With the large type used, the outside lettering would show inside the car, even on heavy paper, hence it was not desirable to print on both sides of a single sheet, but the company wished to use the space occupied by the poster for both inside and outside reading matter. This end was attained by printing the two notices on the same side of a single double-sized poster and then folding in the middle before pasting on the glass.

SAVE YOUR AUTOMOBILE
Why bark your knuckles tinkering with your stiff and balky auto these cold mornings? Store it for the Winter and ride on the street cars.
6c
Will Take You Anywhere in Oakland, Berkeley or Alameda
LET'S GO!!

SAVE YOUR AUTOMOBILE
for Your Next Vacation—Put Your Auto Away for a Few Months and
USE THE STREET CARS
Then, with the money you save, you can take a long automobile trip next summer
6c
Will Take You Anywhere in Oakland, Berkeley or Alameda —AND IN COMFORT
LET'S GO!!

EFFECTIVE ADVERTISING PLACARDS USED BY KEY ROUTE LAST WINTER

One poster took the form of a teaser announcement which was visible to persons on the street. It read, "Ride on the street cars and read the other side of this placard."

The statement on the inside of the car was as follows:

Save your automobile. Are you grinding the life out of your automobile by riding to work in it every day? Use the street cars and keep your machine for pleasure trips. Put the savings into a replacement fund. Six cents will take you anywhere in Oakland, Berkeley or Alameda, comfortably and safely.

Still another poster had the following admonition:

Save your automobile. No blow-outs, no punctures, no parking worries, no danger of accidents, no thieves to protect against when you ride on the street cars. Six cents will take you anywhere in Oakland, Berkeley or Alameda. Let's go.

Wisconsin Men Have Highly Profitable Conference

First Convention of Railway Men Separate from Other Utility Sections Sets a Standard for Future Gatherings — Discussion on Papers Covering the Pertinent Topics of Lubrication, Maintenance of Brakes, Schedules and Safety Brings Out Much Valuable Experience

MEETING for the first time in several years as a separate utility unit, the railway men of Wisconsin convened in Green Bay last week for a two-day session. It is hardly enough to say that this initial summer convention of the railway division of the Wisconsin Utilities Association was a marked success from every standpoint. Aside from the fact that Chairman B. W. Arnold said that there are but two seasons in the Badger state, namely, winter and August, and that the hottest day was reserved for the opening day of the session, the ardor for making a whirlwind meeting was dampened only by the perspiration of the participants. The added heat of the discussion caused all coats to be removed and not even the best efforts of a switching locomotive, whose activities seemed to be mysteriously centered around the meeting room, could drown the discussion provoked by Henry Cordell's paper on bearing lubrication nor defeat the unanimous praise for the wonderful work done in educating employees to the full significance of safety work, so modestly outlined by Charles Warwick. At no time did interest lag in the meeting, which was attended by "the men on the firing line of nearly every railway in the State," to use the words of Chairman Arnold. The numbers were further augmented by the full quota of "commercial ambassadors," as the supply men will henceforth be known in Wisconsin.

Charles Warwick, manager Wisconsin Public Service Company in Green Bay, acted as host and arranged for the entertainment features as well as an inspection trip over his property in a special car. The party was shown a mile of single-track extension constructed with Dayton mechanical ties and welded joints, all imbedded in monolithic concrete to the head of the rail. At the shops a special demonstration of short-arc welding on axles, truck side frames, etc., was staged followed by an exhibition of thermit welding as applied to rail joints. The special car was then headed toward the beach, where some insisted on playing ball in spite of the torrid temperature while others sought relief in the dark-brown waters of Green Bay. The afternoon of play was continued into the evening when all sat down to a banquet at the Bay View beach pavilion. Levity was rife both during the banquet and the dance that followed.

Labert St. Clair, publicity director American Electric Railway Association, was the principal speaker of the evening and, in keeping with the spirit of the occasion, related the status of the electric railway industry in 1922 in the form of an analogy between railway management and matrimony. His very interesting address will be published in part next week.

In his opening remarks at the first session Chairman B. W. Arnold, Oshkosh, said:

"We should be proud of our branch of the utility business and should sell our wares with a pride equal to that of the president of the largest banking concern in our community. It is time to stop apologizing for the street railway business.

"A candidate for public office today must cease running on a platform of lower fares and reduced rates for the utilities. The public demands service and is willing to pay for it. This is the age of *service* and the reputation for *good service* is what will give us our place in the sun.

"The past five years have taught us important lessons in the value of public relations, strict economy of operation and the necessity of closer relations between employer and employee.

"It is my earnest desire that every delegate remember and practice the motto of the International Rotary Club, 'He profits most who serves best.'"

A Warning of the Coal Crisis

J. P. Pulliam, president of the Wisconsin Utilities Association, warned the consumers of coal in that locality against assuming a false sense of security as a result of the settlement of the strike. He declared that the damage wrought by the rail and coal strike had hardly begun to be felt and that the danger of utility shutdowns is still hanging over the public in a menacing manner. He estimated that the public utilities will suffer for the next six months and moreover that their coal bills will be five or six times the amount estimated at the beginning of the year. While the coal strike is settled, Mr. Pulliam maintained that the poor condition of steam railroad equipment will make it practically impossible to move all the coal into Wisconsin in time to prevent a great deal of suffering this winter.

The first formal paper to be read was one on the "Proper Maintenance and Lubrication of Railway Bearings," by Henry Cordell, master mechanic Chicago, North Shore & Milwaukee Railroad, Highwood, Ill. This paper appears in abstract on another page of this issue as does a written discussion prepared by J. H. Kouny, engineer of equipment the Milwaukee Electric Railway & Light Company.

As to the lubrication of ball-bearing motors, Earl F. Harra, master mechanic Eastern Wisconsin Electric Company, remarked that it was their practice to oil GE 258-C motors four times a year or about every 10,000 miles. The cost has been 7 cents per 1,000 car-miles, while there has been but one broken ball in three years time on all their safety car motors.

Frank P. Kittsley, master mechanic Milwaukee Northern Railway, claimed that he is getting good results with babbitt-lined cast-iron bearings. Motor bearings are lubricated on a two weeks basis and journals on a monthly basis. After trying lubrication on a basis of mileage and using a better grade of oil he found that cars had to be taken off the road at inconvenient times for inspection and he also noticed that pull-ins increased. For these reasons he has re-established the calendar inspection, using more oil of a cheaper grade.

Further information on several points was elicited from Mr. Cordell. The armature and journal bearing oiling periods on the North Shore are every 1,000 car-miles. To illustrate the effectiveness of that length of oiling period he said that the train delays on the North Shore Line are but one per 9,514 miles, and 74,219 miles are operated for every train failure.

Perhaps Mr. Cordell exaggerated facts a little when he claimed that the North Shore is a road which never has hot boxes. However, he was not to be outdone by the Scotchman from Iowa, John Sutherland, who claimed that his oiler would commit suicide if a hot box ever occurred on a car in Davenport.

As to the effect of one-direction operation, Mr. Cordell said that much trouble has been experienced on the Ravenswood line of the Chicago Elevated Railroads from hot armature bearings and sharp wheel flanges on the gear side with cars running continuously in one direction. The cause of these troubles has now been removed by turning the cars around once a week.

How to Get Effective Braking

In the remarks following the presentation of Mr. Hill's paper on "Maintenance of Brakes and Brake Rigging" it came out that good results are being obtained on several properties with a special self-lubricating fabric for brake cylinder pistons. This fabric, made by the Westinghouse Air Brake Company, has superseded leather on the Rockford & Interurban Railway and has been in use for about a year on the Chicago, North Shore & Milwaukee

Railroad. Mr. Cordell says that it is his practice to test cylinder leakage and that the maximum drop in cylinder pressure which is allowed is 3 lb. in five minutes. However, it has been his experience that this pressure drop seldom occurs when fabric packing is used.

Comment on slack adjusters showed that they are quite extensively and successfully used on a number of properties in Wisconsin and Illinois. According to Mr. Kouny, all the interurban equipment of the Milwaukee Electric Railway & Light Company has been provided with Anderson slack adjusters. The result has been that the car-defect reports from the crews have been cut down 75 per cent and the former frequent complaints from the transportation department about defective brakes have almost entirely ceased. Mr. Hill explained that slack adjusters on the cars of the Rockford & Interurban Railway have enabled him to run cars on a weekly inspection basis whereas a closer inspection period would otherwise be necessary. All interurban equipment of the North Shore Line has been equipped, he said, for over a year, with the Smith-Ward slack adjuster and during that time there has never been a failure in its positive action. He declared that they were foolproof and also reliable even after the cars had operated all winter through snow and slush.

Standard Piston Travel Important

Mr. Cordell also emphasized the extreme importance of maintaining constant piston travel at all times with slack adjusters on safety cars. Experiments have shown him that the difference in time between an air application and the contact of the brake shoe with the wheel for a 3¼ and a 6-in. piston travel is four-fifths of a second. Considering the condition of traffic through which safety cars must operate, he said that this interval may mean the difference between a safe stop and an accident. In other words, a constant piston travel will make the "feel" of one car similar to that of another and then the operator will not have to become accustomed to different braking characteristics for every car that he takes out.

Nels Jensen, master mechanic Wisconsin Valley Electric Company, has found by experience that proper piston travel is essential in order to have a good braking car and it also helps to eliminate unnecessary wear on the brake equipment in general. If the piston travel is unnecessarily long, the brake-cylinder pressure is thereby reduced and the time required in making stops correspondingly increased. In addition, a greater quantity of air is consumed in brake application than would otherwise be necessary. This causes correspondingly greater wear and heating of the air compressor. If the piston travel is too short, it is likely to cause dragging of the brake shoes while the brakes are released, too high a brake-cylinder pressure with an accompanying liability of sliding wheels, and rough and sudden stops. Besides, with a constantly varying piston travel, the motorman is never sure what retarding effect will follow any certain brake-pipe reduction and he will lose confidence in the flexibility of the brakes. He cannot become as expert in their manipulation as if the operation were more uniform, which, if proper installation has been made, becomes largely a question of piston travel.

On the Clinton, Davenport & Muscatine Railway John Sutherland, master mechanic, said that pull-ins had been reduced 93 per cent by the use of Anderson slack adjusters, which were applied to the cars five years ago. The decreased amount of inspection required has also eliminated one night and one day man in the carhouse. Mr. Sutherland has also effected a large decrease in maintenance and inspection costs by using brake shoes for 15 days only, although some serviceable material must be scrapped. With this method he knows that a car will never have to be removed from service to replace a brake shoe in that 15-day period. The brake rigging itself is given a thorough inspection annually when bushings, pins and other wearing parts are all replaced.

Accommodating Service to Traffic

In line with the subject of regulation of service to suit traffic, opened with a paper by N. C. Rasmussen, J. A. Phelan, general superintendent Rockford City Traction Company and the Rockford Interurban Railway, told of the method used in Rockford to regulate schedules to meet the traffic, as follows:

"Frequent traffic checks have been of great assistance to us. We take passenger counts on all routes at frequent intervals by placing observers at the point of maximum loading, covering a period of eighteen hours. On routes where traffic is light, counts are made by the conductors and they report on specially prepared printed forms. These counts are graphically charted and compared, and have been responsible for several schedule and service changes. The adoption of variable running time and headway can be traced directly to these passenger counts.

"One of our lines starts out in the morning on a seven and one-half-minute headway with sixty minutes for a round trip, and at 8:30 a.m. the headway changes to ten minutes and the running time to fifty minutes for a round trip; at 3 p.m. it again changes back to a seven and one-half-minute headway with sixty minutes for a round trip, and at 8 p.m. changes to a ten-minute headway with fifty minutes for a round trip. This change of headway and running time is true on nearly all of our lines. One line has ten, seven and one-half and five-minute headways—seven and one-half minutes in the morning rush, ten during the normal hours and five during the evening rush.

"Our greatest problem is the tripper service. Our city is a large manufacturing center, and the factories are not all located in one district, although most of them are in the southeast end on a single-track line that has a loop seventeen blocks long and nine blocks wide. Some factories are on the west side of the loop, but most of them are on the east side. In the morning, we run our cars around the loop striking the east side of the loop first, delivering most of the passengers to their destination in the shortest possible time, and in the afternoon we reverse operation on the loop. We operate some trippers directly to the west side of the loop against traffic.

"A daily record is made of the number of passengers carried on trippers, and a daily record is also made of passengers carried on regular cars during the morning and evening rush period, usually from 6 to 8 a.m. and from 4 to 6 p.m. Our trippers are all numbered and we place a typewritten form at a convenient place in the carhouse, and when a man pulls in on a tripper he makes a record of the number of passengers handled. In this manner we have an accurate record of what our cars are doing. We have two inspectors, one directly in charge of trippers, and it is his duty to see that we are furnishing proper service, not too little and not too much. The second inspector is more of a supervisor and it is his duty to observe operation in general and give particular attention to service.

"One really striking example of the extent to which the automobile is cutting into our business is in this southeast end. We do not handle as many passengers by 25 per cent returning from the factory districts as we do going to it. In trying to find a reason for this, we discovered that these people ride home with friends or with some neighbor who collects a certain amount a week for this service and helps pay for his flivver.

"Our trippers from the factory district arrive in the center of the city at a time when stores and downtown factories are closing and we use them to supplement regular service. I agree with Mr. Rasmussen in the idea of through-routing trippers, but due to the fact that our factories have three closing times, namely, 4:30, 5 and 5:30 p.m., it has not been found advisable to install such a service.

"I believe in frequent headway and fairly rapid transportation. We have increased the headway on all our city lines in the last two years, and have increased the scheduled speed from 7½ to nearly 9 miles per hour. Two of our lines have a scheduled speed of over 10 miles per hour.

Getting Traffic in La Crosse, Wis.

Why constant checking of traffic was necessary in La Crosse was told by C. L. Hedges, superintendent of transportation Wisconsin Railway, Light & Power Company, in a prepared discussion, which follows in part:

"We have a number of car riders in La Crosse who go home to their noon

lunches. Mr. Rasmussen is right in his statement that we should encourage this traffic as much as possible. This traffic can be encouraged by having your cars on time and your cars at the transfer points promptly. During the past ten days I have had some construction work and it has been necessary for me to catch a car from our central point at 12:10 p.m. and ride eleven blocks, get my dinner and get back to the central point of town so as to catch the 12:50 p.m. car for North La Crosse. This gave me about twenty-eight minutes to eat my dinner, and I observed during these days that there were numerous clerks and stenographers employed by the Standard Oil Company and the La Crosse Pearl Button Company who had to make the same time. This clearly demonstrated to me that if we are to get the traffic of people going home for their noon lunch it is necessary that our service be on time during that period.

"Mr. Rasmussen has another good suggestion which I have tried out on numerous occasions, the through-routing of a car from one line to another line from the factories. We worked this to very good advantage last year at night when we sent a carload of passengers from our North Side line straight through on our South Side line with no transfers.

"I believe that one of the best things that an operating superintendent can do is to become acquainted with his passengers. By this I mean not limiting himself in his acquaintances to the more important business men and slighting those who might be considered more common factory hands. I am not a possessor of an automobile and perhaps am in closer touch with my riders on account of this fact. I believe that we can learn of a good many of our troubles through knowing the people who ride with us each day."

On the lines of the Milwaukee Electric Railway & Light Company the best and cheapest way of making a traffic check, according to A. J. Killa, is to have the conductors themselves make checks at certain designated points. The conductors in turn are checked by the supervisors. The schedules are based entirely on these counts, which, made in this way, have eliminated a large force of traffic checkers.

Value of Public and Employee Co-operation

After presentation of C. E. Warwick's paper on safety first work, which appears on page 301, Walter T. Bie, claim agent of Mr. Warwick's company, showed to what extent the remarkable work with the public and employees carried on by their own superintendent had reached. His own work, he said, as a claim agent, had been considerably lightened and the company had been benefited financially by the kindly feelings of witnesses toward operators, which meant that they had unconsciously shaded their stories of accidents in favor of the car operator and the company. By explaining to claimants that the effect of paying small claims would put a blot on the car man's record and that his bonus would be lost, he has found that many automobile owners can be persuaded to forego their claims.

Mr. Cordell outlined briefly the intensive continuous safety campaign carried on by the North Shore. Mr. Killa sketched briefly the organization of the Milwaukee Safety Committee, which is quite similar to that of the North Shore. Among other beneficial results obtained he spoke of the great decrease in the number of derailments because of the instruction received at the safety meetings.

In the discussion it was suggested that medals for various grades of efficiency in safety work were preferable to any monetary reward. This suggestion found no second among operators having experience in awarding prizes for safety work and they expressed the opinion that money talks with trainmen. The idea of giving a uniform to trainmen for a good safety record was thought worthy of consideration.

Resolution Adopted

At the final session on Friday morning resolutions were adopted by the association that it approved Secretary Hoover's proposal that Congress grant the government broad powers to control the distribution and the prices of coal; that motor buses used as common carriers be placed by legislative enactment under the regulation of the railroad commission and be made to assume the same obligations as are now imposed upon such railways. A third resolution was adopted expressing the appreciation of the association for M. C. Ewing, general manager of the Wisconsin Valley Electric Company, Wausau, who died Aug. 11. Mr. Ewing was identified with the electric railway industry for the past fifteen years and was an active and earnest worker in the Wisconsin Utilities Association.

Maintenance and Lubrication of Railway Bearings*

An Outline of the Practice that Makes Hot Boxes an Extremely Rare Occurrence on the North Shore Road—Successful Lubrication Possible Only with Proper Mechanical Condition of Bearings

By HENRY CORDELL

Master Mechanic Chicago, North Shore & Milwaukee Railroad, Highwood, Ill.

IF A CAREFUL study were made today of the maintenance cost on electric railroads of this country, we would find that poor practices, cheap material and indifference to causes of bearing trouble figure as a big item in relation to operating cost.

We are all aware of the expensive repairs caused by hot armature bearings, which usually result in cut shaft. ruined bearings, and perhaps loss of armature winding and fields, due to contact with pole pieces. When this occurs the bands usually break and the coils are thrown out, and as the armature is thus not able to turn, the wheels are locked and flat wheels produced.

Hot journal bearings come second in resultant cost. Except in a few instances we find the journal scarred. This means labor to remove and refinish it, and results in a journal of reduced size, loss of service metal and increased chances for hot bearings due to increased load per square inch. As a rule, hot axle or suspension bearings are not so destructive because of the comparatively light load carried, and much labor or time is not required to get the car back on the road. Very seldom is a condition found where the axle must be refinished.

However, the material damage and labor cost on account of hot bearings is probably insignificant when the loss of car-hours, the discomfort to passengers and the difficulty of advertising the road as one of service are considered.

When a car is having trouble I venture to say that the following comments will be heard: The oil is no good; the oiler is lying down on the job; the babbitt is no good; the bearings are not right; the track is in poor condition. Nothing is said about mechanical conditions or supervision. Why? Because it hurts to admit one's own shortcomings, and it is much easier to find fault than to get down and root out the cause of the trouble. It is almost certain we shall find mechanical defects and indifference or ignorance on the part of the men. Don't blame the men if you have failed to instruct them properly.

No matter what oil is purchased it will not keep the cars on the road unless properly used. Too much oil kills the elastic properties of the waste, which then falls away from the bearing. Loose bearings will permit oil to escape, depleting the supply in the wells. Bearings fitting too tightly on shafts, allowing no oil to flow, are often the cause of hot armature bearings. This condition is quite often encountered when bearings are bored with too small a clearance and driven tightly into the shell heads. It is also likely to occur on motors which have seen a good deal of service and the loose heads of which have been repaired by shrinking a band on the outside and by refinishing to the proper fit.

Unless the original alignment of

*Paper presented before railway section of Wisconsin Utilities Association, Green Bay, Wis., Aug. 17-18.

bearings is considered, they will not line up. I refer to the eccentricity of the bearing in relation to the outside fit of the shell head, which condition carries the armature about 3/32 in. nearer to the top field. If only one head were repaired and finished concentric, the armature shaft bearings would bind in both bearings. I have known this condition to exist and cause a lot of trouble.

Some End Play Is Necessary

In assembling motors care should be taken to insure that end play exists, so as to allow for expansion of the armature shaft and to permit a slight oscillation of the armature, which tends to distribute the oil. An allowance for end play of 1/16 in. is sufficient. Armature bearings should be bored 0.0025 in. large for each inch of armature shaft diameter. A small oil groove cut into the face of the bearings from the center of the waste window and slightly inclined downward will help lubricate the bearing face and thrust collar.

Many operators have trouble with excessive end play of armatures. You will find this is perhaps due to excessive wear or play in the axle bearing collars. This wear is not very harmful as long as there is clearance for the gear and pinion in the gear pan, but I have found that play of 1/4 in. to 3/8 in. will throw the shell from one side to the other, driving the armature violently against the heads and causing the armature bearing collars to bend over or break. This is particularly true in high-speed service and with nose-suspended motors.

Babbitting of armature bearings requires careful work, and should be done by a man who understands and realizes the importance of perfect tinning. We can hardly expect a 100 per cent job of tinning old bearings, due to oil that remains in the bearing regardless of the method of cleaning used. However, we can get a 75 per cent job with anchor slots or holes, which will be found satisfactory. Bearing should be struck with a hammer after the babbitt has cooled to test the solidity of the lining. If a hollow or cracked sound issues, the bearings should be done over.

The best pouring temperature for babbitt metal is about 925 to 975 deg. F. In the absence of a pyrometer, the proper temperature of pouring can be determined when the dipping of a white pine stick into the molten metal will char or brown it. As soon as the metal begins to melt, the surface should be covered with powdered charcoal or graphite. This will retard the formation of scum or dross. The tinning bath should consist preferably of pure Straits tin, although other high quality tin will serve almost as well. Solder should never be used for this purpose, because it contains lead, introducing that element into the babbitt during the process of pouring. It is important to keep the pot of tin clean and free from impurities, and a heat should be held where it completely liquefies the tin, care being taken not to overheat it. About 500 deg. F. is an average temperature.

In older type motors using grease lubrication, excellent results will be obtained if the shaft size is increased by shrinking on a cast-iron sleeve. The outside may vary on different types of motors, but I have found that a 3/4-in. increase or 3/8-in. wall thickness of the sleeve worked satisfactorily on GE-57 motors. As a matter of fact, we now have no trouble at all from hot bearings after the completion of this work on all motors. At the same time we discarded the cast-shell bearings and put in service bronze bearings with only 1/16-in. babbitt. This insures us against loss of windings should a hot box occur. The old cast-shell bearings carried 3/4-in. babbitt lining, which would allow the armature to drop on the poles.

Results of Overheating

We find that armature bearings which, when first put in service, had the required press fit in the shell heads, after a few relinings were fitting too loosely. This is generally caused by overheating when old babbitt is melted out prior to relining. Any bearing which presents a pock-marked appearance has been overheated and it is economy to retire it from service, rather than permit a loose-fitting bearing to destroy the fit in shell head. The bore in frame heads, which through the above mentioned condition has become too large for standard bearings, can be rebored and a larger size bearing used. However, special jigs should be used to assure perfect alignment.

The formula under which bronze armature bearings are made differs with manufacturers and operators. We have found that bearings made of the following parts meet with our requirements:

Copper	78	per cent
Tin	12.5	per cent
Lead	8.6	per cent
Phosphorus	0.9	per cent
Manganese	0.013	per cent

Babbitt metal from the following formula gives excellent service for lining armature bearings:

Tin	90 per cent
Copper	6 per cent
Antimony	4 per cent

Hot journal bearings can be eliminated providing proper care is exercised. The causes of hot journals are too numerous for me to mention in this paper. However, I will mention a few which stand out above all others and take them up under two classifications—lubrication defects and mechanical defects. The former includes: Waste not properly saturated; dirty, dead waste; improper packing; oiling by calender instead of by mileage; too much oil and poor waste.

You will find that the majority of railroads have found it advantageous to install proper facilites for soaking of packing waste. Still there are some operators who feel that no particular necessity exists for cleaning or reclaiming old and to all appearances dead waste. It is surprising the saving in waste and oil which can be made by even a "home-made" washing outfit.

The oil in the washing tank should be kept at a temperature of 125 to 150 deg. F. After waste is washed, allow it to drain, and soak before using, as if new waste were handled. Unless resoaked for forty-eight hours and permitted to drain the required time, say twenty-four hours, the waste is too dry, due to the light consistency of the oil in the washing tank on account of the high temperature. The soaking tank should be kept at a temperature of 70 to 80 deg. F.

Packing journal boxes looks like a job which does not require anything but a weak mind and a strong back. Perhaps that is why we have hot boxes. If we feel that the job is too simple to bother with, let's get a good reliable oil company on the job, which can furnish experts to teach our men. The service would be free at that.

Mileage Basis Best for Oiling

Oiling should be done on a mileage basis by all means. We oil and grease our automobile (yes, even a Ford) on so many hundred miles—why not our cars? In interurban service the miles operated per car per day vary considerably. We find cars running anywhere from 100 to 600 miles per day. As the mechanical department has no control over this condition it is apparent that mileage inspection, at which time oiling should be done, is the proper and only correct method. If oiling is done between inspections at different locations on the system the chances are too great that oil will be applied and waste become too soggy, to say nothing about the extra large amount of oil used.

In high-speed service we find that waste will work out toward the front of the journal and we inspect the journals after a 200-mile run and pack the waste back. Very seldom do we find occasion to apply additional oil. On the regular inspection day, that is, after 1,000 miles operation, the front part of the packing is removed, the condition of waste inspected and if found drying out, a small amount of oil is added and the waste properly packed back.

A good grade of wool waste should be used. Substitutes consisting of cotton waste, horse hair, cocoanut fiber, steel shavings, asbestos and what not, are used, but I question if any real economies are gained. We rely on capillary attraction to bring the oil to the journal, and we should use material having this property.

Mechanical defects include: Rough machining of axles, trucks out of square, improper fitted bearing, taper journals, excessive bearing pressure, poor dust guards, inferior bearing metal, improper metal used for lining bearings and rough track.

In machining an axle it is good practice to rough turn the axle all over to 3/32 in. above size. This will eliminate any springing of axle when the final

finish cut is taken. The bearing portions of the axle should be rolled to assure a smooth surface. The rolling process leaves a journal in far better condition than a polishing by abrasives or grinding.

In assembling wheels and axle, see that the pressure is concentrated through the center of the axle. This can be done by using a cap with a small projection fitting loosely in the lathe center and of an outside diameter the size of the journal (not the size of the collar) placed between the ram and the axle. This cap should be slightly crowned on the back. You will find the axle straight after mounting the collars and the check plate grooves true, if this practice is followed. Wheels mounted off-center, that is, not properly located on the axle, will cause binding just the same as if the truck were out of square and will not only produce hot bearings but this condition will increase the flange wear and power consumption.

As a rule very little care is used in fitting car journal brasses. We should see that there is a clearance at the side of the bearings, that fillets are not crowding and that we have more than a line contact. Bearings carrying more than 400 lb. per square inch of projected area of brass very likely will run hot.

One of the worst conditions existing is the taper journal. Not only is the pressure per square inch increased, but the bearing surface is always shifting, causing the lining to squeeze or roll out. Poor dustguards or the absence of them are responsible for this wear. We have been using a metal dustguard on standard 4¼-in. x 8-in., 5-in. x 9-in. and 5½-in. x 10-in. journals and we are having very little trouble. If you measure the journals carefully after say 250,000 miles, you will find most of them worn egg-shaped by several thousandths. Before new wheels are mounted we refinish the journal. Very little stock is removed, and we find it is well worth while.

Journal bearings should be of such a composition that after the lining is worn out the bearings can remain in service until worn out. We find bearings from the formula below give such service:

Copper	65 per cent
Tin	5 per cent
Lead	30 per cent
Nickel	1 per cent

Bearing should be machined and well tinned before they are lined. Babbitt metal consisting of 87 per cent lead and 13 per cent antimony gives very excellent results, and the lining should not exceed ⅛ in. in thickness.

Keep Bearing with the Same Axle

In changing wheels from one truck to another keep each bearing with its own axle and permit them to wear out on the same axle. Changing brasses from one axle to another generally means trouble due to different diameters of journal. Scraping bearings to a fit is a waste of time.

We may trace some of the bearing trouble to rough track, but it is high speed over special work that breaks down the oil film; it pushes the waste away from the journals and cracks the brass. A little friendly talk to the superintendent of transportation generally takes care of this condition if proper co-operation between departments exists.

There is no reasonable excuse for hot axle bearings. A clamping fit over the axle is about the only reason, and this can be avoided if the bearings are of proper bore. An allowance of 0.002 in. for each diametrical inch of axle should be provided. If bearings are too tight, shimming between the two halves provides clearance. Shims should never be put between the axle cap box and the shell. This would allow the bearing to work loose and distort the housing fit, spoiling the dowel pins and brass itself.

Axle bearings should not be permitted to wear to such an extent that gears and pinions are thrown out of proper mesh. A wear of ⅛ in. should not be exceeded. Bearings composed of approximately the following metals give very good results:

Copper	77 per cent
Tin	8 per cent
Lead	15 per cent
or	
Copper	88 per cent
Tin	10 per cent
Lead	2 per cent

I am of the opinion that babbitted axle bearings are inferior to bearings of bronze even though babbitt has a lower coefficient of friction than bronze. The location of axle bearings on electric railway motors is such that they are subjected to much dirt, dust, sand and gritty material, and due to the soft nature of babbitt metal this grit becomes imbedded in the metal, forming a grinding substance which produces excessive wear on the axle. The grit does not imbed itself in the harder bronze and it is flushed out by the lubricants. However, the composition of any bearing metal is only one of the factors in efficiency. The treatment of the metal, the method of casting, the machining, and the design, are certainly as important as the composition used.

No matter what metal or lubricants are used in armature, journal or axle bearings, keep in mind that the mechanical condition must be correct.

Lubrication Costs Reduced 60 per Cent in Milwaukee*

Reduction in Lubrication Expense Effected by Lengthening the Oiling Period from 800 Miles to 2,400 and 3,600 Miles—Used Oil and Waste Are Reclaimed

By J. H. Kouny,
Engineer of Equipment Milwaukee Electric Railway & Light Company, Milwaukee, Wis.

WHEN I compare the practice of the Milwaukee Electric Railway & Light Company with that of Mr. Cordell, I find that to a very large extent our practices are identical. We are at variance somewhat on the types of bearing metals used, the frequency of inspection and lubrication, and in all probability on the quantities of lubricant used, but these must be worked out to suit the operating conditions and equipment on the various properties.

During the war our lubrication costs kept pace with everything else and continued to go higher and higher, and about two years ago, we came to the realization that it was costing us a lot of money. The curtailing of expenses was imperative and here seemed to be an opportunity. Our first thought, of course, as Mr. Cordell pointed out, was that it perhaps was the grade of oil which we were using, but since we knew we were using a good grade, this evidently was not the answer. Looking further, we found that there were a lot of things that were not right, due largely to the lack of proper attention in the machine shop, repair floor, and at the carhouses. Careful supervision, of course, was also lacking. The larger properties, no doubt, all suffered similarly, due to the rapid turnover in help during the war, when we were glad to accept any one who appeared willing to work whether he was qualified for the job or not.

The result of our investigation proved that we were suffering more from over doses of oil than from a lack of it consequently our waste was soggy and was falling away from the bearings We were having many grounded armatures, due to the oil throwing over o our commutators.

Our practice at that time was to ad a gill of oil to all bearings on an 80 car-mile basis (and in many instance this quantity was exceeded) but sinc this gave excessive lubrication, we con ducted tests on twenty-five car equipped with various types of motor and finally decided that by extendin our lubrication period to 3,600 car-mile and adding 1 gill of oil to each axl journal, and commutator and armatur bearing with 1½ gills to the pinion en bearing, no danger from hot bearing would be encountered. On our inte urban cars operating in higher spee service, it was decided to lubricate c a 2,400-mile basis with the additio of but 1 gill of oil, except on armatur bearings when 1½ gills are added to th commutator ends and 2 gills to th pinion ends. We also adopted the wic

*Discussion presented at meeting of Wisconsin railway men, Green Bay, Wis., Aug. 18, 1922, on Henry Cordell's paper "Maintenance and Lubrication of Railway Bearings."

feed system, using 18-in. skeins of long fiber wool yarn waste extending from the bottoms of the oil wells over the bearing windows to the tops of the oil box and then pack between the wicks and the backs of the boxes.

Of course, this practice was entirely revolutionary, as compared to what we had been doing, and the general opinion was that it could not be done. All foremen, sub-foremen, and oilers were carefully instructed as to the practice to be followed, and one of our men, assisted by an oil company expert, was placed in charge of the work. Some of our oilers assumed an indifferent attitude and had to be replaced, but as a whole the system worked out very satisfactorily from the start and is in practice today.

We find it necessary to employ but one man for babbitting bearings, and since this job has changed hands several times during the last three or four years, we found that the best practice was not being adhered to. We, as well as the foreman in charge of this work, assumed that certain things were being done whereas in reality they were not. In machining, we found that the edges of the bearing windows were not being properly chamfered, nor were the oil grooves being cut properly, and in some instances bearings were bored eccentric.

When we started out on our investigation, we had in mind the matter of lubrication, but we soon learned that it was merely a stepping stone toward improving car maintenance as a whole. We not only have been able to reduce our lubrication costs approximately 60 per cent, but have reduced other maintenance costs as well.

While it might seem that I am deviating from the subject assigned me of commenting on Mr. Cordell's papers, by outlining what we have been doing along this line, in reality I am not, for our findings bear out almost to the letter what Mr. Cordell has outlined at the beginning of his paper. He has evidently been through the mill and knows whereof he speaks.

We are fully in accord with Mr. Cordell's practice as to machining tolerances for bearings, and agree that too much care cannot be taken in being assured that they are bored concentric with the outside diameters, but we do not feel that it is necessary to use pure Straits tin for tinning prior to babbitting. We find that half and half solder works out very satisfactorily, and if the bearings are properly heated before tinning and then thoroughly swabbed with a zinc chloride solution, very little solder will adhere to the shells and will cause no trouble due to the introduction of an exceedingly small amount of lead. A pouring temperature of from 925 to 975 deg. F. is too high for genuine babbitt, for the critical point is approximately 925 deg. F., and a pouring temperature ranging from 25 to 75 deg. F. below this figure is correct. In the absence of the use of a pyrometer, these temperatures, of course, can only be approximated. At various times, we have done considerable experimenting with bronze bearings made in accordance with different formulas, and we have found that there is but little to be gained on our property through the use of different alloys for armature, axle and journal brasses, so have adopted but one formula for all, viz:

Copper	85 per cent
Tin	5 per cent
Lead	5 per cent
Zinc	5 per cent

The matter of proper care of waste is one of vital importance, and adequate facilities for saturation and drainage, as well as for reclaiming used oil and waste, not only afford considerable economy, but also assure proper conditions in so far as waste and oil are concerned when a bearing is properly repacked. We have gone to considerable expense in properly equipping our department for handling this work and the expense is well warranted. A brief outline of our practice might be of interest.

Reclaiming Methods Used

When bearings are repacked at the various carhouses, the used waste is accumulated in containers and then sent to the shop for reclaiming. It is then sorted (the very dirty portions being scrapped) and placed in a centrifugal oil extractor, which in reality is nothing more than a centrifugal wringer, such as is used in laundries. It is driven by a steam turbine, and the live steam is allowed to escape into the waste compartment to bring it up to the proper temperature. The centrifugal action of the drum extracts the heated oil from the waste and this is drawn off and run through an oil purifier that extracts the moisture, emulsification or sludge, and all solid matter, leaving the oil in as good condition as when originally used, although of a slightly darker color.

The purified oil is then pumped into the waste saturation tanks, which are of the three-section upper and lower compartment type, where it is heated to 100 deg. F. or the temperature maintained in the saturation tanks. Steam coils placed beneath the tanks are employed in maintaining the proper temperatures.

The waste removed from the oil extractor is carefully sorted and then dried over a steam heated rack. When dry, it is placed in the saturation tanks and immersed for twelve hours in the heated oil and then drained for twelve hours at the same temperature. We find that this is ample time for the proper treatment of the waste and that it will absorb about 2 lb. of oil per pound of dry waste. New waste is treated in the same manner. Since it is impossible to extract the foreign matter from the used waste entirely, this is used in repacking axle and journal bearings only, while new waste is used in armature boxes.

There is one matter that Mr. Cordell has not touched upon to an appreciable extent and that is flange wear on axle bearings, particularly on the larger sizes of interurban motors which do not permit of the use of axle collars. We find that on the commutator sides where the axle bearings are flush with the wheel hubs, the wheel wash runs down the back of the wheels and over the faces of the flanges. The oil film is thus broken and cutting is started. When once started it is difficult to overcome. We have experimented with various types of oil grooves, some merely extending from the bearing windows to the flange faces and others completely across the flange faces, but to date are not entirely satisfied with the results. On motors that permit of the use of flanged axle collars, rather encouraging results are being experienced.

On some of the smaller motors with very narrow oil boxes, it is absolutely essential that care is taken in packing across the entire width of the bearing windows, especially on the armature bearings. This is not the easiest thing to do on account of the offsets toward the flanged ends of the bearings, but hot bearings will eventually develop if proper attention is not given this feature. Of course, it is necessary to have the waste well up against the shafts on all bearings, but on the so-called "baby motors" I feel that the manufacturers have overlooked an excellent opportunity of making these motors practically foolproof as far as lubrication is concerned, for the very narrow widths of the motors would readily permit of more generously designed oil boxes.

Putting Safety First Over the Top in Green Bay*

How a Harmonious Triple Alliance of Public, Employees and Management Was Effected Is Modestly Told by the Man Who Did It

By C. E. Warwick

Superintendent of Railways Wisconsin Public Service Company, Green Bay, Wis.

CAN the safety movement be made an effective auxiliary to function with the present day movement of "merchandising transportation"? Certainly it should add another very important "string to the bow," since every approved safety device and practice will not only aid the sale of transportation, but will greatly reduce the damage suits that are a burden on the net income of the company.

The man in whose hands the prevention of accidents largely lies is the car operator. Some operators drive their car from year to year without an acci-

*Abstract of paper presented before the railway section of the Wisconsin Utilities Association, Green Bay, Wis., Aug. 17-18.

dent. Others do not. To prevent accidents, therefore, we must engage the right kind of operator, then educate him in the rules of safe operation, then keep him keyed up to the pitch where he is trying at all times to prevent accidents. The solution of this last named problem lies, to a great extent, in co-operation. The question is, how can co-operation best be maintained. There are two ways:

1. By engaging and retaining only the proper operators. Street car service is no place for a careless, surly or discontented employee.

2. By a happy family of employees.

The social side of life must not be overlooked. A man whose family is discontented will bring their discontentment on the job with him. Company social affairs should be encouraged. Dancing parties and picnics given quarterly, semi-annually or annually, bowling tournaments or other forms of amusement should be provided. Company employees should not only become acquainted with each other but it is important that the families be given an opportunity to learn that the official forces are human also, that it is men that their husbands and fathers are working for, not heartless corporations. It might be well to consider the issue of free transportation to the wives of operators, for if they are not given this privilege they will make an effort to ride only their husband's cars, and as the operator is only human he will be tempted to let them ride free.

There should be also semi-monthly meetings to discuss means for greater efficiency on safety and service, and quarterly and annual meetings, when the degree of success attained in the work should be emphasized.

It is important to impress upon the minds of all employees that they represent the company to the public and they must act accordingly. For the same reason, the car men who come in daily contact with the public can tell us what the public think of our service. An operator cannot retain an even, contented state of mind when patrons are continuously finding fault. After the safety meetings, there should be a free discussion, at which each man will have an opportunity to voice his likes and dislikes and give suggestions for improvement. Co-operation is what we are after and we cannot have it with hidden or suppressed feelings.

One thing remains. Operators or trainmen should be enthused to the highest degree of alertness to avoid accidents by some incentive. The outstanding characteristic of the American is the desire to win in whatever game he plays. Let us make our desire for perfect safety a game to win and we shall have the additional incentive necessary to avoid accidents.

The goal in this game is the end of a certain period. To reach that goal the player, a car operator, must travel his full quota of scheduled mileage without an accident. His prize for winning is a quarterly or annual bonus or both, not necessarily large, but still a prize, worthy, honorable and worth winning, both as to value and as a matter of record. As soon as one prize is won, another period begins, which may be added to the first period, and an additional bonus offered for successive winning periods. A practical scheme of bonus awards for safety operation follows:

Classification of Accidents:

Classification of accidents to determine the qualification of each trainman, entitling him to the quarterly bonus on the plan herein outlined.

Class "A"—Accident reports on occurrences not likely to result in any claim, both from absence of liability and absence of serious injury or unkind feeling, and where operator is not at fault.

Class "B"—Accidents resulting in injury or property damage, not of a serious nature, involving probable claim, and where the accident might have been avoided by extra precaution, foresight or efficient manipulation of car control.

Class "C"—Accidents resulting in serious personal injury or property damage, caused by careless, indifferent or incompetent operation, or by neglect to observe and practice "Safety" rules.

Class "D"—Near accidents, where serious accident is avoided by foresight and extraordinary skill of operator, and where witnesses will testify to the occurrence.

Class "E"—Accidents to employees.

Safety Efficiency Qualifications:

"A-plus" Records:—Operator has passed three consecutive months without having any class "C" or class "B" accidents and with one or more "D" occurrence to his credit during the time.

"A" Record:—Operator has passed three consecutive months without having any class "C" or class "B" accidents charged against him.

"A-minus" Record:—Operator has passed three consecutive months without having any class "C" and only one class "B" accident charged against him during the time.

"B-plus" Record:—Operator has passed three consecutive months without having any class "C" and two class "B" accidents charged against him during the time.

"B" Record:—Operator has passed three consecutive months without having any class "C" and three class "B" accidents charged against his record during the time.

In compiling Safety Qualifications Record, every class "D" accident credited to the operator for each quarterly period will serve to offset debit of one class "B" accident.

Safety Efficiency Bonus:

For "A-plus" record and "A" record, a quarterly bonus of a $4 refund on his uniform will be given.

For "A-minus" record, a quarterly bonus of a $3 refund on his uniform will be given.

For "B-plus" record, a quarterly bonus of a $2 refund on his uniform will be given.

Accident Reports:

A full and complete written report of every accident, no matter how trivial and whether occurring on or near the car, must be made by the motorman and conductor. Accidents sometimes considered as not worth reporting are often the most serious, troublesome and expensive.

Neglect to report accidents in accordance with the above rule will result in the operator losing his bonus for that quarterly period.

The above is a tentative plan, inaugurated for the purpose of encouraging safety and efficient operation and co-operation. If after a trial of this plan for a period of six or nine months, it is found to be satisfactory to the men and the company, consideration will then be given to offering an annual safety efficiency bonus in addition to the quarterly bonus.

It is hoped that all will join hands in this movement and offer any suggestions that may be an improvement.

The bonus plan, therefore, is our incentive to win in the game of safety or accident prevention. We must never let the idea of winning this game become stale. We must constantly watch the progress of the game just like a football coach who watches to supply new ideas in attack or defense, or to put new vigor or "pep" into tired or slacking players. The effect of this is to keep the machine going the way it was trained to go.

Many ways are open to us to do this as by attractive advertising, both in the press and on car cards and by giving publicity and credit for extraordinary accomplishment in avoiding certain accidents. The rewards will be abundant if we keep everlastingly at it.

In starting a safety movement the officials in charge should bear in mind that it may be necessary to change the habits of their employees and that this is necessarily a slow process in some cases. Attempts to rush the program may lengthen rather than shorten the period of transition. Patience, therefore, should be exercised, but start the game and you will be surprised how interesting it is to put it over the top.

Internationaler Strassenbahn und Kleinbahnverein

THE second biennial convention of the Internationaler Strassenbahn und Kleinbahnverein will be held in Budapest during the first part of September, 1923. The following subjects have already been announced:

(1) Status of electric railway undertakings in Hungary; (2) an international standard classification of accounts; (3) one-man cars; (4) track construction and maintenance; (5) ball and roller bearings, bearing lubrication and gears; (6) new designs in car motors; (7) average yearly performance in car-miles of trainmen and the eight-hour day; (8) magnetic track brakes; (9) fares on electric railways.

Further particulars will be sent out later from the headquarters of the secretary at Favoritenstrasse 9, Vienna.

American Association News

Fine Outing for Section No. 7

THE Connecticut Company held its ninth annual outing at Lighthouse Point, New Haven, Aug. 10, under the auspices of Company Section No. 7.

A delegation of 475 assembled in the Ball Park. Here a parade was formed, headed by the Section Band of thirty-five pieces, when the ball teams from Hartford, Waterbury, Bridgeport and New Haven were escorted around the field. This was followed by ball games and field sports.

Special Trains to Convention

ARRANGEMENTS for transportation to the convention this year will be in charge of the Boosters' Committee. Plans are now being formulated for special trains to be run from various points to Chicago. Railway men and manufacturers will shortly hear from members of these committees with respect to the most desirable schedules. Many pleasant associations and diversions on the trip to the great convention city will be enjoyed as the result of this planning.

News of the Electric Railways

FINANCIAL AND CORPORATE :: TRAFFIC AND TRANSPORTATION
PERSONAL MENTION

Intimidation Must Stop

Court Restrains Union Men from Interfering With Employees of International Railway

Upon application of Henry W. Killeen, of counsel for the International Railway, Buffalo, N. Y., Justice Charles A. Pooley in the Supreme Court has issued an injunction restraining officers and members of the local union of the Amalgamated and all other persons associated with them from interfering with loyal employees of the International, property of the company or persons patronizing the company's cars. The application for an injunction was supported by a long list of affidavits showing assaults on the company's cars, employees and passengers.

Under the injunction strikers are forbidden from parading or marching in masses, companies or bands or collective numbers back and forth in front of and adjacent to the carhouses, stations, power houses and offices of the company. They must not interfere with the free passage of the company's loyal employees and are restrained from obstructing the employees upon any street or public place or threatening them in their homes.

The injunction is directed against intimidation of the company's employees and persons patronizing the cars. Abusive language, including the use of the word "scab," and tormenting signs are forbidden. It is forbidden to compel the International by threats, intimidation or coercion to carry on its business exclusively by union labor or not upon the open shop principle.

Hundreds of jitney and bus drivers have been served with copies of an injunction granted upon application of International to prevent operating of jitneys within the city. Jitney owners must appear in the Supreme Court within twenty days and answer the complaint. Although some jitneys are being operated in defiance of the law and the decisions of Justice Pooley in the Supreme Court and Justice Krause of the Appellate Division, the injunction proceedings instituted by the International have had a tendency to squelch the operation of the autos.

More passengers are being carried on the cars, especially the Main, Kenmore, Hoyt and Elmwood lines, but practically no passengers are riding on the East Side lines, which pass through the foreign settlements of the city. Normal service is being given throughout the day and evening on all local and interurban lines and owl service is being maintained on several local lines.

Since the dynamiting of the Buffalo-Niagara Falls high-speed line and the wrecking of three cars carrying Eastern tourists members of the New York State constabulary have been reassigned to patrol this line.

Under the caption of "Ride on the Street Cars," the Buffalo *Commercial* said in part:

> The strike would be a thing of the past in a few hours if the public made up its mind to ride on the cars and did it. The strikers are laboring under the delusion that the cars are going empty because they have public sympathy with them. Many more are riding on the cars now than did during the early days of the strike, but the way to let the strikers know that they are in the wrong and that their fight to shackle the company with union domination is lost is to fill the cars with passengers.

Responsibility for the strike and the way it has dragged along since July 1 is due entirely to Mayor Frank X. Schwab, according to Henry W. Killeen, counsel for the International, and editorials appearing in local newspapers.

In commenting editorially upon Mayor Schwab's attitude, the *Commercial* said:

> Schwabbery has made the name of Buffalo a byword and a stench in the nostrils of the whole country. The news that it is unsafe for people to come here is traveling far and wide. Schwabbery will protect the cut-throat and the dynamitard. How long are the people of Buffalo going to put up with Schwab?
>
> Have the law-abiding citizens the courage of their convictions or are they afraid of the consequences of standing four square against the forces that are now ruling with dynamite and gun?

Louisville Case May Go to Courts

H. R. Petty and Don Warren, Councilmen of Louisville, Ky., who led the fight which defeated the Mayor's fare ordinance in the lower board last week, are imbued with the bus idea. Mr. Petty is said to plan to submit to the Louisville Taxicab Company for consideration a scheme for operating buses at 5 cents and to bring a similar proposal to the attention of the Associated Motor Industries Corporation, which recently took over the plant of the Kentucky Wagon Works.

Mr. Petty said that a franchise for a bus line would be offered to the Council at the next meeting. The Quin fare bill is generally regarded as dead, although the Board of Aldermen will pass it without a dissenting vote, it is predicted. The lower board will then have another opportunity to pass it.

The Louisville *Herald* and the Louisville *Times* have charged that subsurface influences defeated the bill, which seemed to have the support of citizens. The opinion of the *Times* is that the people have the right to good railway service and that it is to their interest that injurious experiments of a competitive nature be discouraged.

The proposal of bus lines is not taken seriously, and unless by a miracle the Quin fare bill is passed, the case will return to the courts, where, it is estimated, it will require at least three years for settlement.

House Passes Bill Reducing Commission Members

A bill recently introduced before the Georgia State Legislature reducing the size of the State Railroad Commission from five to three members, and appropriating $70,000 for the operation of the commission, has been passed by the House and is now virtually certain to become a law before the present Legislature adjourns. Mention of this bill was made in the *Electric Railway Journal*, issue of Aug. 5. The original appropriation intended to be carried was $40,000. The expenses of the commission are raised by a special tax on the utility companies of the State subject to the commission's jurisdiction.

Prospects Bright for Electrifying the Katy

Engineers have submitted their report on the proposed electrification of the Missouri, Kansas & Texas Railway from Dallas to Denton, a distance of 48 miles. According to C. E. Calder, president of the Texas Power & Light Company and of the Dallas Power & Light Company, the cost is placed at between $800,000 and $1,000,000 by these engineers. Mr. Calder said:

> Electrification of the Missouri, Kansas & Texas from Dallas to Denton will be an economic proposition from the standpoint of the railroad, as well as the electrical interests. An electric line to Denton would take practically all passenger traffic from a steam line. The electric company would pay the railroad rental for the use of its track, and both would profit from such an arrangement.
>
> From the standpoint of the territory served, electrification would be even more pleasing. The Katy operates only six trains, two of them night trains. Interurban service on such a line would be hourly.

Negotiations between the electrical interests and officials of the Katy are under way, although it is said no definite agreement has been reached. It is proposed that the electrical interests shall lease the trackage rights, and that electrification of the line will in no way interfere with operation of freight trains on the line, nor in the operation of through passenger trains.

Officials of the electric companies interested in the proposition are hopeful that an agreement can be reached and construction work on the electrification of the line started by the beginning of 1923.

Mr. Calder pointed out that a contract with the railroad for electrification would comply with an agreement made with the city of Dallas for the construction of an interurban line at least 30 miles in length which the Dallas Railway is under bond to build in order to fulfill the terms of an agreement entered into in connection with the granting of the franchises to the Strickland-Hobson interests in 1917.

Dynamite Outrage

Buffalo-Niagara Falls High-Speed Train Believed to Have Been Wrecked by Strike Sympathizers

About fifty tourists in a three-car train being operated over the high-speed line of the International Railway between Buffalo and Niagara Falls were injured at midnight on Aug. 17 when the train ran into a section of track which had been destroyed by dynamite. Company officials believe that strikers or their sympathizers are responsible for the outrage and Herbert G. Tulley, president of the International, has offered a reward of $10,000 for information leading to the arrest and conviction of the dynamiters.

Second Attempt Succeeds

This is the second time sections of the Buffalo-Niagara Falls high-speed line have been blown up by dynamite since the strike was called on the local and interurban lines of the International on July 1. The first damage was done to a steel bridge over Gill Creek on the outskirts of Niagara Falls. Cars in all parts of Buffalo have been badly damaged by dynamite and many employees have been injured.

Mitten Management, Inc., has enlisted the aid of four nationally famous detective agencies in an effort to bring about the arrest and conviction of the dynamiters. Several clues have been found, but it is reported that no direct evidence has been obtained by the detectives.

Excursionists Made to Suffer

The three-car train which was wrecked was running as a special carrying Philadelphia, New York and Baltimore tourists who had just arrived in Buffalo on an excursion over the Pennsylvania Railroad. The motorman did not see the damaged piece of track until he was only a few yards away. It was then too late for him to avoid running into it. The first two cars left the rails, but remained upright, while the third car turned over in the ditch. Most of the injured were in the rear coach.

Immediately after the accident detectives found a charge of 50 lb. of dynamite on the Buffalo-bound track of the International's high-speed line. The battery was connected for the charge and detonator caps were adjusted, but apparently the plot to destroy this track was frustrated by the arrival of the excursion special and the wrecking of this train. The vestibules of the steel cars were wrecked.

Robert C. Lacey, chairman of the board of arbitration of the Central Labor Council of Western New York, and five striking employees of the railway, members of the Amalgamated, are under arrest charged with illegal possession of dynamite. Additional arrests will probably be made.

While all the prisoners are charged with illegal possession of high explosives, several are charged with illegal transportation of dynamite. The District Attorney says these are only technical charges to hold the men pending the final outcome of the investigation into the dynamiting of local cars and the wrecking of the Buffalo-Niagara Falls train.

Dynamite Derailed and Ditched This Car

Newspapers Demand Amalgamated Act

In commenting upon the arrests Buffalo newspapers demand that the Amalgamated Association repudiate its members alleged to be implicated in the dynamiting outrages and assist in the investigation.

Burns' detectives claim to have discovered a plot on the part of strikers and their sympathizers to wreck the steel arch bridge of the railway across the lower Niagara gorge. As a result members of the New York state constabulary have been detailed to guard the foundations of the structure in the lower gorge of the Niagara River and also the American approach to the structure. Dominion police are guarding the Canadian end of the bridge.

Utilities Meet Test of "Truth in Advertising"—Now, "Tell it to the World"

In a recent letter to Mr. Lytle of the Illinois Committee on Public Utility Information regarding the proposed Public Utility Advertising Association, Alfred Fischer, director of the Michigan Committee on Public Utility Information, raised two interesting points. First, he asked how the new plan would fit in with the advertising service now being established by the American Gas Association and other national bodies. Second, he wondered if it was necessary to stress the needs of ethical advertising practices in the utility field.

Both of these points have been answered in a letter written to Mr. Fischer by W. P. Strandborg, of the Portland Railway, Light & Power Company, Portland, Ore., who is chairman of the organization committee of the Public Utility Advertising Association. On the first point Mr. Strandborg says that, in his judgment, there can be no conflict or confusion with anything the one public utility may be doing in the way of getting its story over with the people. He points out that the main point involved in the proposed plan is that up to the present time the public utilities of the country, as an industry, have no official standing or recognition in the great organized advertising movement, and it is this formal and valuable recognition that is now being sought, not for one utility or group of utilities, but for the whole family of major utilities working together in the common cause.

Again the plan now being developed, explains Mr. Strandborg, will provide a tremendously valuable clearing house for all the utilities that use advertising or publicity and enable the new association to take advantage, for the good of all, of the successful things that may have been achieved in one or more of the utilities through their individual experience and observation. For instance, if some great national movement vital to all the utilities should arise that required the joint and united attention of gas, light and power and electric railway interests, the new association would have the machinery and equipment for meeting the situation at once and efficiently.

On the second point raised by Mr. Fischer Mr. Strandborg says that it is well known that the utilities are adhering to the rigid requirements of "Truth in Advertising," but that the need exists for telling the world about it; in other words, to let the public know that the utilities are on record absolutely in this matter, and that what the railway, the gas and the electric companies say in the printed word may be accepted at par.

It is Mr. Strandborg's opinion that there is no better way of accomplishing this than to have the message carry the stamp of approval of the Associated Advertising Clubs of the World.

Strike Appears Settled

The Toledo & Western Railroad, Toledo, Ohio, operated by receivers, has apparently settled its strike as far as operation of the road is concerned. A strike was called by platform employees about April 20 and within six weeks from that date all service was restored. The men had asked for an increase in wages amounting to about 4 cents an hour. The receivers were willing to negotiate several questions on working conditions, but the men walked out without replying to offers made by the receivers. New men were hired and as soon as they were broken in the trains were put back into service. Freight service was first restored.

A restraining order was granted by the Federal court at Toledo and two deputy marshals were put on duty at Sylvania to protect the property. Several arrests have been made under the order, but no defendants have been tried. Little damage has been done to property or trains. Linemen who wanted to go out in sympathy with the trainmen went back to work without any negotiations when the Federal court advised the receivers to have nothing to do with them.

Former platform men of the railway are operating three passenger buses and two trucks in competition with the railway, but so far have not made serious inroads upon the revenues of the railway.

Wage Issue Up in Pittsfield

A three-day hearing on the wage issue between the Berkshire (Mass.) Street Railway and its employees began at Pittsfield on Aug. 22, with former Gov. Samuel W. McCall sitting as neutral arbitrator. Joseph Berry represented the company and James H. Vahey the employees, the neutral arbitrator having been chosen by them. The pay of blue uniform men under the agreement that recently expired was a fraction less than 47 cents an hour for first-year men, about 50 cents for second-year men and a fraction more than 53 cents for third-year men. One-man car operators got 6¾ cents an hour more. The company seeks to reduce wages by about 10 per cent. Employees seek an increase and have proposed a plan by which compensation would be placed in part on a commission basis.

Interurban Proposal Revived

Talk of an interurban line connecting Tampa, Fla., with various points to the east and north—probably running as far as Orlando and Sanford—has been revived with the announcement of plans of the Tampa Electric Company, a Stone & Webster subsidiary, for bidding on the contract to furnish current to the city of Lakeland and plans to run a power line to that city if the contract is secured. T. J. Hanlon, manager of the Tampa Electric Company, will not discuss the interurban line talk, feeling that such a possibility is too far in the future. He has gone to Boston to discuss the power proposition with Stone & Webster officials and make up a definite bid to deliver the current.

"To Open Up as Many Channels as Possible"

With the idea of developing a relationship so that the public will have a closer idea of railroad problems and the railroad management a closer idea of their patron's problems a "Committee on Public Relations" has been announced by Ralph Peters, president of the Long Island Railroad System. Mr. Peters in addressing the committee at its first official meeting said that periodical publications in developing good will had been very satisfactory but that now the railroads must do more to keep its patrons informed of railroad problems. He emphasized the need of more liberal education for the employees. The committee is now engaged in formulating plans for carrying out the ideas outlined by the chief executive of the road and when completed the program will be made public.

Commissioners Plan Electrification

The harbor commissioners of the Port of Montreal, Can., have started to electrify the surface lines at the terminals. Forty-two miles will be electrified this year, and the balance of the trackage, 16 miles, will be electrified next spring. M. P. Fennell, the present general manager of the port, is in charge of the electrification. When the electrification of the 42 miles is completed, two electric locomotives will be leased from the Canadian National Railways for the balance of the shipping season. It was necessary owing to the freight congestion on the lines and at the piers either to purchase at least five more new steam locomotives or electrify the system.

Keeping a Pledge

The efforts of the Binghamton (N.Y.) Railway to improve its property are receiving public recognition. The *Morning Sun* of that city in its issue of Aug. 18 said:

> The Binghamton Railway, after many difficulties not of its own making, has kept its word to the city. The promise made at the time the municipality permitted the 6-cent fare, has been fulfilled. Seven more of the latest type of trolley cars are in operation and the service has been improved proportionately. These seven cars represent an investment of more than $80,000 and they are in every way in keeping with the best standards of service.
>
> No trolley company in the land is free from criticism. There are times when the best equipped lines fail in an emergency. Schedules are upset, cars are crowded and patrons are forced to wait on street corners. But in Binghamton there has been a constant improvement and the service here at the present time compares pretty favorably with that in any other city. Whether or not trolley patrons generally are willing to admit this, they will at least give the present management credit for an honest effort to make good. And where honest effort exists the public is not slow to recognize it. Fewer people are "knocking" the company and perhaps that is all any public service corporation can expect.

News Notes

Electrification Proposed. — Representative Richards of Malden, Mass., recently propose delectrification of the Sangus branch of the Boston & Maine Railroad while Judge Walcott of the Chamber of Commerce asked for the consideration of a plan to run trolley cars over the Fitchburg tracks from Arlington through Cambridge to Lechmere Square.

Junior Police Have Day's Sport.— Miss Safety First of the Philadelphia (Pa.) Rapid Transit Company entertained 600 boy traffic policemen on June 28 at Willow Grove. These boys during the school semester act as auxiliary policemen at the crossings near their schoolyards. The company organized this patrol. T. E. Mitten, president of the company, took personal charge of the children and Charles Bainbridge supervised the afternoon contests.

Railway Employees Delight in Gardens. — Carhouse employees of the Pittsburgh (Pa.) Railways are responsible for creating a real beauty spot in Oakland. More than 200 men who report at the Craft Avenue carhouse have had a hobby this year, namely, planting and caring for flowers, so that now wonderful flower beds adorn the spot to the amazement of pedestrians, antomobilists and electric riders who pass this section. The men promise that next year the display will be greater than ever.

New Wage Contract Entered Into.— C. S. Banghart, general manager of the Augusta-Aiken Railway & Electric Comporation, Augusta, Ga., has just entered into a new wage contract with the trainmen of his company for a wage scale of 41 cents an hour for the first six months' service, 43 cents an hour for the second six months service and 45 cents an hour thereafter. The old wage contract, which recently expired, provided a wage scale of 46 cents an hour for the first six months service, 48 cents an hour for the second six months service and 52 cents an hour thereafter.

No Strike in Memphis.—There have been no further developments in the threatened strike last week of the employees of the Memphis (Tenn.) Street Railway, the men voting down the strike themselves even though the hourly wage was slightly reduced. The board still has under consideration the various problems. The company is still in the hands of receivers, but it is thought not for long. The State Utility Commission is dealing with other questions affecting the several Memphis public utility companies and their affairs are in better shape, indicated by the service and steady improvements going on. The 7-cent fare still obtains.

Financial and Corporate

Reorganization Committee Purchases New Orleans Property

The properties of the New Orleans Railway & Light Company, New Orleans, La., was sold on Aug. 17, by Master in Chancery Chaffe, under instructions from Judge Rufus Foster of the United States District Court. The sale was made in two parts. The first property offered comprised all the holdings of the railway, consisting of real property, rolling stock and securities. The second property consisted of 958 4½ per cent gold bonds of $1.000 denomination. There were only two bidders. G. H. Dahl, vice-president Chase National Bank, New York, acting in behalf of the reorganization committee, bid $14,500,000 for the property as a whole, and Charles K. Beekman, also of New York, bid $620,000 for the gold bonds. Confirmation of the sale is now up to the court for action.

At the meeting of the Commission Council on the evening of Aug. 17, Commissioner of Public Utilities Maloney withdrew the ordinances that were previously introduced and substituted three new ordinances in accordance with the agreement reached with the securities committee. These ordinances give the city an option to purchase the gas property at $8,652,000 plus any additional amount invested in the property subsequent to Dec. 31, 1920; the electric light property at $11,040,000, and the street railway property at $25,000,000.

Indeterminate permits are granted to the company in lieu of a franchise for a fixed period. The city is to have supervision and control of the operation of the utilities and will have the right to levy a tax on gross receipts of the utility after the allowable rate of return is earned. It is estimated that the tax will net the city about $320,000 a year. A paving program is provided which obligates the company to pave between the tracks and 18 in. on each side. This will add about 50 miles of paving to the company's obligation. After reorganization of the company has been effected, the two ordinances will be advertised for two weeks.

Cost of Service Exceeds Receipts by $104,149

The total revenue of the Boston (Mass.) Elevated Railway in July of last year was $2,534,775. Last month it was $2,472,137. However, 1,770,130 more revenue passengers were carried than during the same month last year. The cost of service exceeded receipts by $104,149. This was slightly better than was anticipated because heavy expenditures were incurred during the month for the construction of tracks and other maintenance work in accordance with the usual practice.

The average fare paid by each passenger during July was 8.896 cents, and the number of 5-cent passengers carried was 22.05 per cent of the total revenue passengers.

Power Merger Attacked

The Attorney General of Tennessee has filed suit in the Chancery Court, alleging the recent merger into the Tennessee Electric Power Company of the Chattanooga & Tennessee River Power Company, Nashville Railway & Light Company, Tennessee Power Company and the Chattanooga Railway & Light Company was in violation of the State's anti-trust law and "a scheme to gain monopoly of the electric power development of the State."

The allegations are similar to those brought against the Tennessee company in the United States Court by the Ducktown Sulphur, Copper & Iron Company. The contention of the attorneys of the company is that the anti-trust law of the State has been superseded by the public utilities commission law and that the public is now safeguarded against excessive rates.

BOSTON ELEVATED RAILWAY RECEIPTS AND COST OF SERVICE—JULY

	1922	1921
Receipts		
From fares	2,404,325	2,444,596
From other sources	53,102	51,555
Total receipts from direct operation of road	2,457,427	2,496,151
Interest on deposits, income from securities, etc.	14.708	38.623
Total receipts	2,472,136	2,534,774
Cost of service		
Transportation expenses (including wages of car-service men)	836,576	871,440
All other expenses	1,739,710	1,798,064
Total cost of service	2,576,286	2,669,504
Excess cost of service over receipts	$104,149	$134,729
Revenue passengers carried		
10 cent passengers	21,082,822	23,644,661
5 cent passengers	5,966,895	1,634,926
Total revenue passengers carried	27,049,717	25,279,587
Total receipts per revenue passenger	9.139c.	10.025c.
Receipts from fares per revenue passenger	8.896c.	9.676c.
Cost of service per revenue passenger	9.523c.	10.560c.

Year	Fare (Cents)	Total	Average Weekday	Average Saturday	Average Sunday	Average Holiday
1915	5	28,948,241	934,719	1,076,296	804,095	721,292
1916	5	30,107,539	1,000,582	1,146,208	743,680	645,999
1917	5	31,517,011	1,041,405	1,166,407	827,284	845,458
1918	5	30,572,041	1,018,179	1,145,967	697,513	798,177
1919	8–10	21,214,338	816,222	835,906	580,684	640,117
1920	10	26,640,614	887,374	950,939	644,308	673,825
1921	10–5	25,279,587	871,216	888,039	556,838	630,881
1922	10–5	27,049,712	924,227	978,326	626,220	542,431

	Latest	Month Ago	Year Ago	Peak	1913
Street Railway Fares*	Aug. 1922 **7.01**	July 1922 **7.04**	Aug. 1921 **7.20**	May 1921 **7.24**	**4.84**
Street Railway Materials*	July 1922 **181**	June 1922 **172**	July 1921 **164**	Sept. 1920 **247**	**100**
Street Railway Wages*	Aug. 1922 **210**	July 1922 **211**	Aug. 1921 **218**	Sept. 1920 **232**	**100**
Steel Unfilled orders (Million tons)	July 31 1922 **5.78**	June 30 1922 **5.64**	July 31 1921 **4.83**	Apr. 30 1917 **12.18**	**5.91**
U.S. Bank Clearings Outside N. Y. City (Billions)	July 1922 **12.30**	June 1922 **12.88**	July 1921 **11.03**	March 1920 **18.54**	Av. Mo. 1913 **6.12**
Business Failures	July 1922	June 1922	July 1921	Jan. 1922	Av. Mo. 1913
Number	**1,568**	**1,656**	**1,491**	**2,722**	**1,213**
Liabilities (millions)	**42.15**	**38.41**	**70.15**	**105.7**	**24.64**

Conspectus of Indexes for Aug., 1922

Compiled for Publication in this Paper by

Albert S. Richey

Electric Railway Engineer Worcester, Mass.

	Latest	Month Ago	Year Ago	Peak	1913
Eng. News-Record Construction costs	Aug. 1922 **173.4**	July 1922 **169.7**	Aug. 1921 **193.1**	June 1920 **273.8**	**100**
U.S. Bur. Lab. Stat. Wholesale Commodities	July 1922 **155**	June 1922 **150**	July 1921 **141**	May 1920 **247**	**100**
Bradstreet's Wholesale Commodities	Aug. 1 1922 **12.07**	July 1 1922 **12.11**	Aug. 1 1921 **11.06**	Feb. 1 1920 **20.87**	**9.21**
Dun's Wholesale Commodities	Aug. 1 1922 **173.6**	July 1 1922 **173.7**	Aug. 1 1921 **163.7**	May 1 1920 **263.3**	**120.9**
U.S. Bur. Lab. Stat. Retail food	July 1922 **142**	June 1922 **141**	July 1921 **148**	June 1920 **219**	**100**
Nat. Ind. Conf. Bd. Cost of living	July 1922 **155.6**	June 1922 **155.4**	July 1921 **163.1**	July 1920 **204.5**	(1914) **100**

*The three index numbers marked with an asterisk are computed by Mr. Richey, as follows: Fares index is average street railway fare in all United States cities with a population of 50,000 or over, except New York City, and weighted according to population. Street Railway Materials index is relative average price of materials (including fuel) used in street railway operation and maintenance, weighted according to average use of such materials. Wages index is relative average maximum hourly wage of motormen and conductors on street and interurban railways in the United States. †Revised weighting.

Railway Responsible for Tax

In the opinion of Malcolm Douglas, prosecuting attorney for King County, the Puget Sound Power & Light Company and not the city of Seattle is held responsible by King County for more than $540,000 in taxes and interest on the street railway system for 1919. If the city has agreed to pay three-fourths of the tax, the opinion states, it is the duty of the company to collect that amount from the city, for the county proposes to collect the entire amount from the company. The opinion also held that the County Commissioners have no power to waive payment of the city's three-fourths share of the interest due on the tax. The tax is $401,018 and 15 per cent interest. The Commissioners requested the opinion after receiving the request of the City Council that the city's share of the interest be waived and that the company be allowed to pay its share, one-fourth, of the entire amount forthwith, with the city being allowed the privilege of paying the remaining three-fourths in installments. The street railway system was transferred to the city of Seattle by the Puget Sound Power & Light Company March 31, 1919, and the suit followed when the company and city held that the lines were public property when the taxes fell due and were therefore non-taxable. The county's position, upheld by the courts, was that the system was private property when the tax was levied and therefore taxes were due for the entire year.

Detroit Municipal Increases Net Income

The City of Detroit Department of Street Railways for thirty-one days ended July, 1922, reports a net income of $100,892 against $98,743 for the thirty days ended June of this year. The total number of passengers carried increased from 36,715,466 for the June period to 36,904,425 for July. The details of operation are contained in the accompanying table.

City of Detroit

Department of Street Railways

INCOME STATEMENT AND OPERATING STATISTICS, JULY, 1922 COMPARED WITH JUNE, 1922

	July, 1922, 31 Days	Cents per Car-Mile	June, 1922, 30 Days	Cents per Car-Mile
Operating Revenue				
Revenue from transportation				
Passenger revenue	$1,489,136		$1,480,978	
Parlor, chair and special car revenue	109		246	
Total	$1,489,245	37.5	$1,481,224	38.3
Revenue from other railway operations				
Station and car privileges (adv.)	$7,391		$6,754	
Rent of track and facilities	85,678		89,793	
Miscellaneous	2,482		758	
Total	$95,551	2.4	$97,305	2.5
Total operating revenue	$1,584,796	39.9	$1,578,529	40.8
Operating expenses				
Ways and structures	$181,977		$159,952	
Equipment	98,930		117,078	
Power	140,091		148,433	
Conducting transportation	564,211		559,588	
Traffic	119		Cr. 1	
General and miscellaneous	118,114		105,681	
Total operating expenses	$1,103,442	27.8	$1,080,731	28.0
Net revenue railway operations	$481,354	12.1	$497,798	12.8
Deduct taxes assignable to railway operation and miscellaneous rents	54,574	1.4	61,281	1.5
Net operating income	$426,780	10.7	$436,517	11.3
Non-operating income				
Net income from miscellaneous property	569		1,082	
Income from unfounded sec. and accounts	.....		3,709	
Total non-operating income	$569		$4,791	0.1
Gross income	$427,349	10.7	$441,308	11.4
Deductions				
Interest notes payable	$10,245		$11,507	
Sinking fund construction bonds	37,748		37,747	
Sinking fund purchase contract	142,016		142,016	
Interest fund construction bonds	51,260		65,895	
Interest fund purchase contract	85,189		85,400	
Total deductions from gross income	$326,458	8.2	$342,565	8.9
Net income	$100,892	2.5	$98,743	2.5
Ratio operating expenses to revenue from transfers		74 per cent		73 per cent
Ratio operating expenses to operating revenue		70 per cent		68 per cent
Ratio net income to operating revenue		6 per cent		6 per cent
Revenue car-miles operated	3,975,552		3,859,405	
Non revenue car-miles operated	7,569		4,751	
Total car-miles operated	3,983,121		3,864,157	
Earnings per car-mile		.375		.38
Earnings per car-hour		1.946		1.99
Expenses per car-mile		.278		.28
Expenses per car-hour		1.440		1.45
Revenue passengers carried	27,838,688		27,692,462	
Transfer passengers carried	9,065,737		9,023,004	
Total passengers carried	36,904,425		36,715,466	
Ratio of transfer passengers to revenue passengers		32 per cent		32½ per cent
Revenue passengers per car-mile operated		7		7
Transfer passengers per car-mile operated		2		2
Total passengers per car-mile operated		9		9

Valuation Figures Revised

A revised appraisal of the Manhattan & Queens Traction Corporation property submitted to the New York Transit Commission by the bureau of valuations increases the estimate recommended for acquiring operating property for inclusion in city-owned traction system from $885,993, the original estimate, to $995,860. The estimate is based on original costs less the expenditures necessary to place the road in first-class operating condition.

On 1910-1914 price basis, less depreciation, the net correction is $3,382, increasing the original estimate of $1,113,263 to $1,116,645; on the basis of 1921 prices, the former estimate of $2,158,871 is changed to $2,164,498.

The Transit Commission was informed by the valuation bureau that the recommended valuation for the Richmond Light & Railroad Company property, through an arithmetical error incorrectly placed at $3,122,943 in the original estimate, is revised to $2,729,659.

Following the announcement of the revised appraisal, counsel for the security holders of the Richmond company protested that the estimate is incomplete, inaccurate and insufficient, and does not represent the real value of the property. Counsel disclaimed any obligation to be bound by the valuation, declaring it to have been made without due process of law and in violation of the Constitution of the United States and the Constitution of the state of New York.

Court Orders Property Sale

Sale of the property of the Asheville & East Tennessee Railway, Asheville, N. C., has been ordered by Judge Henry P. Lane of the Superior Court. The petition in receivership was filed a few weeks ago. Debts of the company, including bonds, amount to about $70,000. The length of the road is 9 miles. The sale will probably be held in October.

Second Sale Brings $42,000

The property of the Monmouth County Electric Company, Red Bank, N. J., was sold at public auction for the second time on Aug. 8 by order of the United States District Court. At the first sale last May the road brought $33,000 and when it lacked confirmation R. L. Marshall, New York, offered $36,000. The court ordered a resale and the second time it brought $42,000. The tracks, wires, copper and poles were bought by Samuel Altman of Long Branch and E. Gelb & Son of Newark.

The sale will have to be confirmed by the United States District Court at Trenton. The sale means the end of this 17-mile railway built twenty-five years ago. The stockholders will lose all. The holders of receivers' certificates will share first in the receipts. All the municipalities will lose their tax charges, which total more than the receipts of the sale.

Moore Interests Reported Sold

Machold & Riddell, Philadelphia engineers, have notified the City Commissioners of Wildwood, N. J., that the Henry D. Moore interests, which owned the West Jersey Electric Company and the Five-Mile Beach Electric Railway, have sold their holdings. It is said that the railway company and the electric company have been purchased by Atlantic City interests. A committee appointed by the Wildwood City Commissioners to investigate the possibility of purchasing the Wildwood plant at the request of the petitioners had not completed investigation before the deal was consummated. It is understood that should the long distance service of power prove unsatisfactory to the city it will install a municipal plant for lighting the streets and the public buildings and insist that the stipulations in the original ordinance grant to the electric light and trolley companies be carried out by the new purchasers.

Public Utilities Lead in September Maturity Obligations

Public utility obligations falling due in September total $66,176,200. In this list the main item is the Interborough (N. Y.) Rapid Transit Company's 8 per cent notes, of which $39,199,000 are outstanding. It is proposed to pay the noteholders 10 per cent in cash and extend the balance ten years to Sept. 1, 1932. The combined total of railroad, public utility and industrial bonds falling due in September amounts to $84,391,540.

Balance of $8,434 in Toledo in July

Operations of the Community Traction Company, Toledo, Ohio, for July show that the Toledo properties earned a balance of $8,434 to go into the fare stabilizing fund, bringing that reservoir up to $145,643. Through added maintenance cost in summer months the ratio of operating expense to gross income rose from 68.68 per cent in June to 71.24 per cent in July. Additional service, amounting to 300 car-miles per day, was put in operation during July.

A block of bonds of the Community Traction Company was purchased by the sinking fund for municipal ownership, bringing the total holdings up to $255,000 of the 6 per cent bonds and $60,000 in cash. The monthly income from these bonds, which amounts to $1,275, will be added to the $17,708 contribution made from earnings each month which goes into the sinking fund.

Operation of one-man cars on the Bancroft line has proved very successful, Commissioner W. E. Cann reported. About sixty more of the one-man cars will be placed in operation as soon as delivered from the shops.

Daily passenger travel decreased from 163,722 revenue passengers a day in June to 159,167 revenue passengers in July.

Checks of both street railway and bus operation since Aug. 1, when about thirty buses were forced to suspend operation in direct competition with street railway lines, have shown that street car revenues have increased an average of $320 a day. The remainder of the forty or more buses will be forced to find new routes not paralleling the traction lines as soon as licenses expire.

Improvement Noted in Second Quarterly Report

According to the quarterly report of the United Traction Company, Albany, N. Y., operating revenues and operating expenses decreased for the quarter ended June 30, 1922. The operating revenues were $775,160 against $785,316 for the preceding quarter and an increase of $711,174 over the same quarter a year ago. The operating expenses for the 1922 June quarter were $604,533 against $637,453 for the preceding quarter and against the corresponding period of a year ago the operating expenses show a decrease of $116,172. The net corporate income for the quarter ended June 30, 1922, is $7,968, while the net corporate deficit for the preceding quarter was $17,598.

The number of passenger fares collected in the quarter just ended is 11,022,749. During the preceding quarter the number was 11,202,763. The report shows an increase of 10,157,599 passenger fares collected for the quarter just completed over the number collected during the same period in 1921.

Passenger car miles for the quarter ended June 30 were 1,692,188 with the number for the preceding quarter 1,680,397.

Financial News Notes

$1,500,000 Note Issue Called.—The United Light & Railways Company, Grand Rapids, Mich., has called for redemption as of Oct. 1, 1922, all of the $1,500,000 issue of 7 per cent bond-secured gold notes, Series B, issued as of Nov. 1, 1917, and due April 1, 1923.

Gain in Net Income.—The Hudson & Manhattan Railway, New York, N. Y., reports a balance of $432,796 for the seven-months period ended July 31, 1922. This compares with $91,447 for the corresponding period of 1921. Expenses from January-July, 1922, were reduced to $3,555,615 from $3,559,009 obtained in the corresponding months a year ago.

May Build New Plant.—The Sedalia City Light & Traction Company, Sedalia, Mo., plans to abandon its present plant if the plans for financing a new plant are approved by the Missouri Public Service Commission. The present power and railway plant has been in operation for twenty-five years. The new plant would cost $362,000.

Notes to Be Redeemed.—The five-year 7 per cent collateral trust gold notes of the Detroit (Mich.) United Railway amounting to $500,000 have been called for payment Sept. 1 at the office of the Central Union Trust Company, New York, N. Y. They will be redeemed at 100½ and interest. The notes are dated April 1, 1918.

Deficit for Six Months' Period.—A deficit in the revenues of the Shore Line Electric Railway, Norwich, Conn., for the six months ending June 30 of $5,746 is shown by the report filed in court by Receiver R. W. Perkins. Although there were gains over outgo in April and May, there was a deficit in the June operations. The total receipts from all sources for the six months period were $110,631.

Sale Recorded.—A copy of the transfer deed turning over the properties of the Tennessee Power Company to the Tennessee Electric Power Company for $50,000,000 has been recorded in the county register's office at Nashville. The law requires that a copy of the deed be recorded in every county where any part of the property is located. The document lists all the properties and plants included.

Another Sale of Long Island Property.—The property of the New York & North Shore Traction Company, which extends from Flushing to Whitestone and from Flushing to Mineola on Long Island, and has not been operated recently, will again be offered for sale at public auction on Sept. 24. At the sale held on July 24 a scrap dealer bid $15,000 for the equipment of the defunct road. This figure was so low that the sale was set aside.

Authorization of Sale Sought.—Corporation Counsel Walter F. Maier of Seattle, Wash., has been requested by the utilities committee of the City Council to draw up an ordinance authorizing acceptance by the city of the deeds and bills of sale of the Greenwood lines, purchased from the Pacific Northwest Traction Company and the Western Washington Power Company. The purchase price was $55,000, to be paid in 5 per cent utility bonds. The city has been operating the lines for two years under a gentlemen's agreement.

Preferred Stock Dividend Resumed.—The Cities Service Company, New York, N. Y., on Aug. 18, placed the preference "B" stock back on a cash dividend basis, in compliance with the plan announced in June. The board of directors declared the regular one-half of one per cent monthly dividend payable in cash Oct. 1 to stockholders of record Sept. 15. At the same time one-half of 1 per cent in cash was declared on the preferred stock, and the regular dividend of one-half of 1 per cent on the common stock payable in scrip and 1¼ per cent payable in stock scrip were declared as of the same date.

Traffic and Transportation

Patrons Request Higher Fare

The Waverly, Sayre & Athens Traction Company, Waverly N. Y., is charging 20 cents per zone between the hours of 12:30 a.m. and 5:30 a.m. on its lines in the State of Pennsylvania. The petition for a 20-cent rate was in effect a request of numerous patrons of the railway that the company be granted the requisite authority to charge and collect on its lines in Pennsylvania during the specified hours an additional 10 cents per zone. The application, unique in the annals of the commission, was approved of with the requirement on the part of the company of filing statements every three months showing the revenue received from this service and the operating expenses.

The company, which has its New York terminus in Waverly and a Pennsylvania terminus in Athens, was collecting a 10-cent cash fare per zone on its line in Pennsylvania with a ticket fare of thirty tickets for $2.40. It was the contention of the company that the installation of the all night service, which was for the accommodation of employees of the Lehigh Valley Railroad who worked at Sayre, could not be furnished at the existing rates and meet operating expenses.

Wants to Co-operate in Motor Safety Campaign

The Connecticut Company, New Haven, Conn., recently issued Accident Bulletin No. 4½ announcing its intention of giving the heartiest co-operation to the Commissioner of Motor Vehicles in his continuing safety campaign "in an effort to bring the automobile hazard to the lowest of any State." The bulletin states that more than half of the company's accidents involve automobiles and that extra precaution upon the part of the railway operators might prevent accidents to the exceptionally careless auto drivers. The bulletin says that the only safe course is "Look out for hand signals from auto driver; look out for carelessly driven automobile. In other words, Look Out! Look Out!! Look Out!!!"

Fight Looms Over Extending Six-Cent Fare

A legal fight appears to be imminent in the city of Dallas, Tex., over the extension to the Dallas Railway by the city of the 6-cent fare for a period of one year. A petition bearing the signatures of 2,503 individuals, was recently filed before the Board of City Commissioners asking that the ordinance granting the fare extension be submitted to the people for their approval at a referendum election, as provided in the city charter.

City Attorney Allen Charlton held that the ordinance granting the fare extension was not subject to the referendum provision of the charter, the referendum provision stating that an ordinance was subject to the referendum only when a petition signed by the required number of qualified voters was presented to the City Commission within thirty days after the passage of the ordinance and before it became effective, or where such ordinance dealt with the granting of a franchise. The city attorney held that the ordinance granting the fare increase was not subject to the referendum provision, since the measure did not deal with the granting of a franchise, and since it was passed with the emergency clause and there was no period of thirty days between its passage and the date on which it became effective during which a referendum petition might be filed.

W. S. Bramlett and Leo S. Tresp, attorneys for the petitioners, then threatened mandamus suit to compel the submission of the ordinance for referendum, and it is believed that such suit will be filed in a few days.

Weekly Pass on Chicago "L"

Unlimited-Ride $1.25 Ticket Forms Part of Fare Reduction Plan—Bus Feeders Proposed—President Budd Convinced the Principle of the Pass Is Correct, but Realizes Its Application Is an Experiment

A VOLUNTARY experiment in furnishing the people of Chicago with unlimited elevated transportation on a weekly pass was announced on Aug. 18 after the Chicago Elevated Railroads had filed a voluntary petition with the Illinois Commerce Commission for a downward revision of rates. The plan provides for the sale of a weekly unlimited ride transferable pass for $1.25 good between all points south of Howard Street. Another, the price of which is $2 will be good for any points between Chicago and Evanston. Unless stopped by the Commerce Commission, the fare plan automatically becomes effective thirty days from the date of filing—that is, Sept. 18.

On the day following the announcement of a revision in rates, the Elevated disclosed its intention to install some supplementary bus lines. Three lines were announced connecting with the elevated trains at Fullerton Avenue, Logan Square, and Fifty-first Street stations. Certificates of convenience and necessity will be filed with the Commission and permits to operate the new lines will be asked of the City Council and the park board.

The cash fare on the buses will be the same as that on the elevated—10 cents, but free transfers will be given from the elevated cars to the bus riders and for those wishing to transfer to the buses from the elevated trains. The proposed weekly pass will be accepted on the buses as well as on the L trains.

Under the new plan, the cash fare rate, 10 cents south of Howard Street and 7 cents between that point and Evanston, remains unchanged, but the following reductions are contemplated under the proposed new time schedule:

Tickets good between points south of Howard Street will be sold at the rate of three for 25 cents instead of four for 35 cents as at present, a reduction of 8⅓ cents to 8⅓ cents.

Tickets good between Evanston and Chicago will be sold at the rate of two for 25 cents instead of 13 cents straight. The saving is half a cent a ride.

Children between the ages of seven and twelve may ride between any point south of Howard Street for 3 cents and between any points north of Howard Street for the same amount, making a total fare of 6 cents from Chicago to Evanston as opposed to the full 13-cent ticket rate or 17-cent cash fare now charged.

School children between the ages of twelve and seventeen upon presentation of age certificate signed by their teacher, may purchase 50-ride coupon books for $2.50, good between any points south of Howard Street and for $4 between Evanston and Chicago. These books, which are good for an indefinite period, as long as the coupons last, provide a flat 5-cent fare in the city and an 8-cent fare to Evanston. Children under seven years of age when accompanied by an adult may ride free as at present.

The weekly passes will be good from midnight Sunday until midnight of the following Sunday. They will be placed on sale on Friday, the sale to continue until the following Wednesday. It is expected that the use of the pass will increase the number of short-haul riders and thereby decrease the average length of ride, which at present is 6¾ miles.

Britton I. Budd, president of the elevated, said:

> The rate schedules which have been filed with the Illinois Commerce Commission are a result of two years of serious consideration, which I have given to the subject of devising a more satisfactory form of fare on the elevated lines. I have long wished to see the quantity user given the benefit of a lower rate, which is impossible under the uniform fare system.
>
> I have given a good deal of thought to the zone system in common use in many European cities and tried in some of the eastern cities in this country. While the zone system is equitable in that the farther a passenger rides the more he has to pay, still there are practicable objections to its use in Chicago which has been built up under the flat fare system.
>
> The weekly pass plan, provided for in our new schedule, is based on the principle that the passenger who uses the lines frequently is entitled to a lower rate than

the casual rider. The same is true with regard to the new children's rates provided in the schedule.

The effect which this innovation in local transportation may have in the revenues of the company is problematical. It is a big business venture on which we are taking a chance because we believe it is based on correct principles and will be beneficial to the people now served by our lines and to the companies.

For that reason we are willing to make the experiment.

The various cities taking up the weekly pass have been mentioned in these columns from time to time. Now there are about sixteen in all which have successfully tried out the plan. However, this will be the first attempt to experiment with the pass in a city of more than 175,000 population. The pass plan for Chicago was worked out by Walter Jackson, fare consultant, who first put the pass scheme into operation at Racine, Wis., in the summer of 1919.

ROUTES FOR BUSES

The proposed bus routes are as follows:

Route No. 1—From Logan Square station west on Wrightwood Avenue to Columbus Avenue, returning to Logan Square station by the same route. Distance, 1 mile.

Route No. 2—From Fullerton Avenue station, on Fullerton Avenue to Commerce Avenue, south on Commerce Avenue to Belden Avenue, to Lincoln Parkway West, south on Lincoln Parkway and North Park Avenue, to North Avenue and west to Sedgewick Street, returning by the same route. Distance, approximately 2 miles.

Route No. 3—From Fifty-first Street station on Fifty-first Street, past Washington Park, on Hyde Park Boulevard, south on Everitt Avenue to Fifty-sixth Street, the north boundary of Jackson Park, returning by the same route. Distance, approximately 2½ miles.

It is planned to operate the buses on ten-minute headways, but this schedule will be governed by the amount of traffic. Each bus will probably carry twenty-two passengers and will be patterned after the type of vehicle now being used by the Chicago, North Shore & Milwaukee Railroad in Wisconsin. It is said that the buses have already been ordered and are expected to arrive in time for placing them in operation early this fall.

Bus Line Would Interfere with Railway Business

C. B. Hammond of the Elmira, Corning & Waverly Railroad, Elmira, N. Y., has very forcibly expressed his disapproval of the proposed bus line between Elmira and Waverly on the ground that it would parallel and naturally compete with the interurban railway line. His claim is that the bus line would pay only if it drew business away from the trolley line, which would result ultimately in crippled railway service with a higher rate of fare. He claimed further that the earnings of the trolley company were not enough to pay operating costs and interest on the actual value of the property.

5,966,895 Five-Cent Passengers in Boston in July

By a careful selection of the routes over which it feels justified and authorized to give service at reduced rates the Boston (Mass.) Elevated Railway is spreading the 5-cent fare gradually in Boston and surrounding communities, so that today it is carrying nearly one-fourth of its passengers at 5 cents each.

In connection with the issuance of its financial statement for July, Edward Dana, general manager of the company, informs public that at least two more routes are in immediate contemplation for the nickel fare, one of those running out from the important Dudley Street terminal. Of course, the basic fare will continue at 10 cents, which is fixed by law and must remain unimpaired until the company shall have paid back the $4,000,000 which it has received fom the various communities it serves as their contributions to cover its operating deficit when income was running behind the cost of service.

The theory on which the Elevated can create 5-cent routes under the present law is that they do not take away traffic from the regular 10-cent routes. It will be noticed by the statement for July that the number of passengers traveling for 5 cents has increased from 1,634,926 in July, 1921, to 5,966,895 in July, 1922.

Accidents Reduced—Result of Safety Campaign

In a safety campaign to reduce the number of street car accidents in Atlanta, the Georgia Railway & Power Company has obtained a pledge of cooperation from virtually every business and corporation in the city operating a fleet of automobiles or trucks, this pledge promising that the companies will exact the greatest care of their drivers in order that accidents may be lessened. The idea of a co-operative campaign of this nature first originated with S. E. Simmons, superintendent of transportation of the Atlanta company, and since it became effective President Arkwright advises that there has been a notable reduction in the number of street car accidents in Atlanta occasioned by collisions with automobiles or trucks. By greater care on the part of both the motormen and drivers accidents have been so largely reduced that the railway company is now planning a similar movement with all civic organizations in the city, to carry on a campaign to interest individual drivers in the cause of "Safety First."

One-Man Car Issue Up

The one-man car proposition has again come up in Salt Lake City, where the Utah Light & Traction Company operates. The company has remodeled several of its cars for this kind of operation. Members of the State Public Utilities Commission and City Commissioners have been asked to inspect the cars. H. F. Dicke, general manager of the Salt Lake property, has arranged for a conference with the company employees, who will strenuously object to any proposal including this system of operation.

Would Substitute Bus for Railway

The abandonment of the railway system in Spartanburg, S. C., and the substitution of a bus service has been proposed to the City Council of Spartanburg by Henry M. Earle, attorney for the bondholders of the South Carolina Light, Power & Railways Company, who at a recent receiver's sale of that company purchased the properties and is organizing a new company to take over the railway on Sept. 1. The proposal has been set forth in a letter which has been sent to the Council.

Seeks Five-Cent Fare

The plan of Mayor A. V. Fawcett to raise the fare on the Tacoma Municipal Railway to 5 cents straight, without transfer interchange with the Tacoma Railway & Power Company lines, is opposed by Commissioners John L. Murray and Ira S. Davisson. Commissioner J. W. Silver, nominal head of the railway department, also declared that many tideflat workers had telephoned, threatening opposition measures if the city did away with transfer privileges. Mayor Fawcett then dropped his resolution providing transfer interchange. Two ordinances covering the same subject and establishing a straight 5-cent fare also went over for future consideration. It is expected that some effort to get more than 2 cents out of the nickel paid the city in fare will be made, by agreement with the Tacoma Railway & Power Company, before the subject is revived.

The report of City Comptroller John M. Roberts for the operation of the municipal line during June showed that it was more than paying operating costs, exclusive of interest and tax charges, and had $1,219 to apply toward these charges. This is the best showing made in recent years.

Hearing on Fort Worth Fare Issue Scheduled

Officials of Fort Worth, Tex., have brought action against the Northern Texas Traction Company to secure a reduction in fares from 7 cents now prevailing. N. A. Dodge has been appointed by the Federal Court as referee to hear evidence in the case. The hearing has been set for Aug. 28 in Fort Worth.

In discussing the coming hearing George H. Clifford, vice-president and general manager of the company, declared that the company could not maintain the present service if the fare were reduced. Mr. Clifford made comparisons with other cities to show that the service in Fort Worth is really worth 8 cents.

He placed valuation of the Fort Worth properties at $6,500,000 and asserted that the earnings of the company were less than 4 per cent on that valuation even with 7 cent fares.

Interurban Rate Cut

The Railroad Commission of California has authorized the San Francisco, Napa & Calistoga Railway to reduce its individual monthly commutation fares between all points to basis of fares in effect prior to the increase granted beginning with the year 1918. The authorization will bring about a reduction of 16⅔ per cent, restoring the fares to pre-war levels. The effective date is Aug. 25.

The reductions will affect employees of industries and others who require daily service between Vallejo, Napa, Napa Junction, St. Helena, Calistoga and other points. The reductions are shown as follows, the lower of the alternative rates not applying to limited trains.

Between Vallejo and	Present Fare	New Fare
Napa Junction	$4.62	$3.85
Napa Junction	5.28	4.40
Napa	11.64	9.70
Napa	13.38	11.15
St. Helena	23.82	19.85
St. Helena	27.36	22.80
Calistoga	30.00	25.00
Calistoga	34.44	28.70

The same percentage reductions will be made in commutation fares between San Francisco and points on the electric line.

Petitions Seek Repeal of Jitney Ruling

Petitions bearing the signatures of 1,800 persons asking the repeal of the ordinance barring jitneys from certain streets have been filed with the Board of City Commissioners of Fort Worth, Tex., as a counter move in the fight to compel the Northern Texas Traction Company to reduce fares from 7 cents to 6 cents. The City Commission pigeon-holed the petitions, on the ground that the city government is now engaged in its greatest effort to force a reduction in fares, a hearing having been set before Referee N. A. Dodge for Aug. 28, referred to elsewhere in this issue, and until this hearing is held and the matter disposed of, the officials refuse to permit any new movement to be launched. Allegations set forth in the petitions are that the law tends to stifle one business in the interest of another and is discriminating in its application; that it is against a sound policy to grant a monopoly to the Northern Texas Traction Company and that as a result of the monopoly the fare has been raised 40 per cent to the great detriment and injury of the citizens.

Conductors Relieved of Ticket Selling on Chicago Surface Lines

An order relieving the conductors of the Chicago Surface Lines of the duty of selling tickets on the cars was granted by the federal court on Aug. 17. The order became effective during the week ended Aug. 26, contingent, however, upon the Surface Lines furnishing the court with a list of all places at which tickets may be purchased by the passengers. The order received some opposition despite the promise made by Chester Cleveland, City Hall traction attorney, that the city would agree to the change as an inducement for the men to settle the strike.

The Surface Lines have already completed arrangements for the car tickets to be on sale in more than 340 convenient stores, offices, and banks throughout the city.

A committee of the trackmen conferred last week with Williston Fish, general manager, and Harvey P. Fleming, chief engineer of the Surface Lines, on the new wage offer which has been made to the men. The new rate, 54 cents an hour, it is expected, will be adopted by the men.

Two groups whose wages have not yet been settled by a vote of the union men were to have held meetings early this week to consider the new scale. Completion of negotiations with them and with the trackmen will mark the close of wage debates.

Transportation News Notes

Seeks Increased Fare. — The New York State Railways has petitioned the Public Service Commission for permission to increase passenger fares in Utica and vicinity.

Approves Bus Petition.—The Massachusetts Department of Public Utilities has approved a petition of the Northern Massachusetts Street Railway for the ownership and operation of jitney buses in the town of Athol.

Collection of Excess Fares Discontinued.—Collection of the 10 cents excess fare from passengers who pay their fare on cars instead of purchasing tickets at stations, as authorized by the state law, has been discontinued by the Indiana, Columbus & Eastern Traction Company, Cincinnati, Ohio.

New Transfers to Be Put in Use.—W. R. Alberger, general manager of the San Francisco-Oakland Terminal Railways, Oakland, Cal., has announced that a new type of transfer will be put into use on Sept. 1. On one transfer passengers will be allowed to travel between any two points within the transfer limits.

Lower Fare Request Denied.—Mayor Quigley's request for a uniform 5-cent fare within the city limits of Chelsea, Mass., has been denied by Frank Hardy local manager of the Chelsea division of the Eastern Massachusetts Street Railway. Mr. Hardy said it would be impossible to make such a reduction and keep the division on a paying basis.

Free Rides for Men of Fleet.—When the Pacific Fleet visited Seattle, Wash., on July 3, 15,000 passes, good over Seattle's Municipal Railway System for one day, were issued to the officers and men of the fleet. The passes read "Good for transportation on the line of the Seattle Municipal Railway July 3, 1922, when presented by an officer or an enlisted man of the Pacific Fleet."

Will Discharge Passengers from Rear.—The United Traction Company, Albany, N. Y., is making arrangements to equip all the double-truck cars with devices which will enable the operator of the one-man cars to discharge passengers from both the front and the rear. The new plan of passengers alighting from the cars at the rear, will relieve congestion.

Excursions Favored.—Trolley excursions are becoming popular at Hartford, Conn. The Connecticut Company a few weeks ago established the running of one big car from Hartford to Crystal Lake and now it takes three cars to accommodate those who go. The excursions are run Wednesday afternoons with an average of 200 persons. The round trip is 60 cents, while the regular fare is $1.25.

Twelve Rides for $1 Authorized.—The Massachusetts Department of Public Utilities recently authorized the Brockton & Plymouth Street Railway, Plymouth, Mass., to issue tickets containing twelve rides for $1 in place of the present form, containing twenty rides for $1. Officials of the company at a hearing before the commissioners said the twenty-ride experiment had proved unprofitable to the company.

Will Carry Mail.—Owing to the suspension of the Dayton, Toledo & Chicago Railroad, the Dayton, Covington & Piqua Traction Company, West Milton, Ohio, will transport mail from Dayton to Englewood, Union, West Milton, Pleasant Hill and Covington. Plans for the delivery of mail to residents along the route of the suspended railroad were formulated by the railway mail service in the Cincinnati post office.

No Promise of Lower Fares.—President Lucius S. Storrs of the Connecticut Company, New Haven, Conn., stated recently that it was impossible at this time to say when fares would be lowered in Connecticut. He stressed the fact that the company was feeling the business depression and that the weather had not been conducive to heavy summer traffic this year. He would give no indication and no encouragement to the idea that fares would drop in the near future. It was all a matter of expenses and revenues, he said.

Five-Cent Fare Denied.—The petition for a 5-cent fare between stations on the Boston, Revere Beach & Lynn Railroad has been denied by the Massachusetts Department of Public Utilities. Mayor Noone and the City Council of Revere favored the lower rate. The present fare is 10 cents between stations with a 5-cent fare to school children within the limits of the cities and towns. The department in its decision said that it would be impracticable at this time to differentiate for the purpose of fare collection between the local and the through riders.

Personal Mention

A. R. Baxter Appointed General Superintendent at Indianapolis

Amos R. Baxter, Rushville, Ind., has been appointed general superintendent of the Indianapolis & Cincinnati Traction Company, Indianapolis, according to an announcement by C. L. Henry, president. Mr. Baxter has been in the employ of the company several years and is promoted from auditor. He will have headquarters at 310 Traction Terminal Building, Indianapolis. C. A. Dugle has been named auditor with headquarters at Rushville. Mr. Henry also announced the appointment of George W. McKenney to the position of transportation superintendent. Mr. McKenney has been chief train dispatcher of the line and will be succeeded in that position by Frank McClelland. The three men have been in the service of the company for years. Mr. McKenney is the Democratic candidate for treasurer of Shelby County.

R. L. Hughes, formerly superintendent, is now general manager of the Ashtabula (Ohio) Rapid Transit Company.

E. B. Hardin is now auditor of the Piedmont & Northern Railway, Charlotte, N. C. The position was formerly held by J. M. Martin.

E. M. Gilbert has been elected vice-president, to succeed Thomas Cheyne, of the W. S. Barstow Management Corporation, New York, N. Y.

Charles Elsey has been elected president of the Tidewater Southern Railway, Stockton, Cal. He was formerly treasurer and will continue this work in addition to his new duties.

P. F. Thompson has been appointed superintendent of the Scioto Valley Traction Company, Columbus, Ohio. This position was formerly held by C. Skinner.

L. W. Van Bibber, for some time auditor of the Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, is now auditor of the Columbus, Newark & Zanesville Electric Railway with headquarters at Springfield.

E. Carey is auditor of the Sault Ste. Marie (Mich.) Traction Company, S. V. McLeod is purchasing agent and James N. Franz is general manager. F. M. Turnbull was formerly auditor and L. L. Jacobs purchasing agent.

Fred Lacy has been promoted to the position of master mechanic of the Highland Grove Traction Company, McKeesport, Pa., from that of electric engineer and engineer of overhead construction.

F. H. Watriss, who has been vice-president, is now president of the Austin (Tex.) Street Railway, E. P. Wilmot filling the vacancy in the vice-presidency. J. F. Springfield was the president before the recent change.

H. H. Sanborn has been elected president of the Fresno (Cal.) Interurban Railway, to succeed Thomas M. Paterson, who becomes vice-president, succeeding F. O. Cooke. H. J. Culler is agent in charge of all stations.

Franklin P. Jones is now president of the West Chester (Pa.) Railway. He was elected to this position to fill the vacancy caused by the death of George D. Woodside. Mr. Woodside had been president since 1916.

C. V. Link has been appointed assistant to the vice-president of the Cincinnati (Ohio) Traction Company. E. H. Berry, formerly engineer of roadways, is now engineer of maintenance of way, while J. H. Sundmaker is acting as engineer of roadways.

Jack Groff, who has been engineer of overhead construction of the Grand Forks (N.D.) Street Railway, has been promoted to the position of master mechanic. Norman Jackson is engineer of overhead construction, and Pete Housour is engineer maintenance of way.

Gaylord Thompson, general manager of the New Jersey & Pennsylvania Traction Company, is a candidate for the City Commission of Trenton, N. J. Mr. Thompson is a civil engineer by profession and has had considerable experience in municipal work. He is a native of Ohio. He went to Trenton in 1913.

E. M. Knight, who for the past several years has been resident engineer in Parkersburg, W. Va., of the Monongahela Power & Railway Company, has been promoted and will have headquarters at Fairmont, W. Va., as assistant to the chief engineer of the system. Mr. Knight will be succeeded here by Howard Carr of Fairmont.

Charles P. Hoffman, president of the Bethlehem Transit Company, South Bethlehem, Pa., has taken over the duties of general manager in addition to those of president, which he has held for some time. V. R. Weaver is now auditor, the position held formerly by M. M. Cannon, and W. H. Garner is now superintendent.

D. E. Byerly, who was formerly superintendent of the Montgomery Light & Power Company, Montgomery, Ala., has accepted a similar position with the Hattiesburg (Miss.) Traction Company. He assumed his new duties a few days ago. J. L. Haley, formerly manager of the Hattiesburg company, has accepted an executive position with the Adirondack Light & Power Company, New York, and will take up his duties there before the end of August.

F. T. Pomeroy has been elected president of the Cleveland, Southwestern & Columbus Railway, Cleveland, Ohio. He had been connected with the company for some time and previous to his present work was third vice-president and secretary. Other changes have been made recently. L. M. Coe has been elected vice-president, filling the position formerly held by L. J. Wolf, and C. J. Mayers has been appointed auditor, succeeding A. F. Jones.

Obituary

James Kennedy, for several years associated with *Railway and Locomotive Engineering* as associate editor and managing editor, died on Aug. 14. At the time of his death he was editor and president of the Angus Sinclair Publishing Company. Mr. Kennedy was in charge of the locomotive shops of the New York Elevated Railroad from 1879 to 1902. He was seventy-two years old at the time of his death.

M. C. Ewing, secretary, treasurer and general manager of the Wisconsin Valley Electric Company, Wausau, Wis., died on Aug. 10, after an illness of more than a year. Mr. Ewing was one of the principal figures in the promotion and construction of the Wausau Street Railroad and became its general manager. In 1909, three years after the building of the railway, the company was consolidated with the Wausau Lighting & Power Company and Mr. Ewing was made general manager, secretary and treasurer, the position he held at the time of his death. Mr. Ewing was interested in public utility matters throughout the State. He was one of the promoters of the railway system in Grand Rapids and led in the development and consolidation of the water power of Wisconsin River Valley. Mr. Ewing was president of the Wisconsin Electrical Association in 1915.

S. L. F. Deyo, who was in charge of the construction of the first subway in New York City, died at his summer home in Norfolk, Conn., recently. He was for some time chief engineer of the Interborough-Metropolitan Company, New York. Mr. Deyo started his railroad work, after graduating from Union College in 1870 with the degree of civil engineer, as a rodman on the Harlem River branch of the New York, New Haven & Hartford Railroad. Later he was in charge of construction of the line from Harlem River to Pelham Bay as resident engineer. From 1873 to 1876 he served as assistant engineer for the improvement on the Fourth Avenue line. For five years Mr. Deyo was superintendent of the American Metaline Company. Before becoming chief engineer of the Interborough-Metropolitan, he was chief engineer of the Rapid Transit Subway Construction Company of New York.

Manufactures and the Markets

DISCUSSIONS OF MARKET AND TRADE CONDITIONS FOR THE MANUFACTURER, SALESMAN AND PURCHASING AGENT

ROLLING STOCK PURCHASES BUSINESS ANNOUNCEMENTS

Efficiency of American Labor

The question of the efficiency of American labor, particularly in comparison with the standards of output which prevailed prior to the war, is the subject of an article in the July number of the *Monthly Labor Review*, contributed by Ethelbert Stewart, U. S. Commissioner of Labor Statistics. Mr. Stewart shows that the basis for much of the current belief that the American workman is not as efficient now as formerly is found in general statements which have no backing of statistical proof. Against this state he presents considerable data from particular industries showing that a proper consideration of all the elements entering into production does not evidence a general slackening of effort on the part of the workers but in a number of industries increased efficiency is shown. Mr. Stewart urges the need of time-cost studies as a basis for scientific measurement of labor efficiency, not with a view to "speeding up" industry but for the purpose of establishing a definite standard by which the work may be judged.

Elastic Tariff at Last

One of the very important phases of the new tariff bill is its provisions for flexible tariff. This is the first time any elasticity in tariff rates has won the approval of either branch of Congress. The amendment proposing to enlarge the Tariff Commission did not prevail, but the commission is authorized to hold hearings and to conduct continuous investigations with the idea of remedying any inequities that may be found in tariff rates. The Tariff Commission will submit its finding of facts to the President, who is empowered until July 1, 1924, to revise rates, either up or down, not to exceed 50 per cent. The date of July 1, 1924, was selected by the majority party so that in the event of a change of administration the power would not be conveyed to a Democratic President.

The present measure is no different from any of its predecessors so far as unanimity of opinion is concerned about its fairness. It is all a matter of degree. It all depends upon the point of view. It would be manifestly impossible to expatiate at length upon the provisions of the bill to the industry from all angles. And it probably would do no good to do so. The point of view of the purchaser is seldom the point of view of the buyer. For instance, is there much to wax enthusiastic over, either to the buyer or the seller, about the fact that telephone, telegraph, trolley and electric light poles of cedar or other wood were placed on the free list on motion of Senator Kellogg, whereas it had been proposed originally to place a duty of 10 per cent on such imports?

The metal schedule has undergone more meddling perhaps than any other single section. In its final form, however, the more important rates remain little changed from those provided in the House bill. The Senate made substantial reductions in duties on tool steel ores and alloys. The rate on pig iron has been reduced from $1.25 to 75 cents a ton and on scrap from $1 to 75 cents. There has also been a slight reduction in rates on structural and fabricated material and a reduction from 7-40 of 1 cent per lb. on steel rails to 1-10 of 1 cent per lb. and an additional duty of 10 per cent on cold-worked nickel, alloys, bars, etc., and slight decreases in the duty on tool steel.

In the closing days of the tariff debate a heavy reduction was made in the Senate in the duty on incandescent electric lights, the rate standing in the bill as it goes to conference at 20 per cent ad valorem.

The bill has gone to conference under a special rule and Republican leaders say they hope to have it enacted into law by Oct. 1. There have been reports that the measure will be the object of sharp controversy in conference, particularly as it relates to the American valuation and the foreign valuation plans, the former being the House and the latter the Senate plan, but the general belief is that Chairman Fordney of the House committee on ways and means will yield to the Senate.

Coal Situation Only Slightly Relieved

Little Surcease Apparent for Electric Railways in Cleveland Settlement—Utility Associations Are Exerting Their Influence with Authorities at Washington

SO FAR as the electric railways and other utilities are concerned the coal situation is largely a bundle of contradictions. Just now it appears more than likely that most electric railways will succeed in muddling through without being seriously crippled, but for others, particularly small companies, unless help comes very soon, there will be curtailment of service in the near future with complete abandonment of operation in prospect for the not distant future. The very meagerness of the requirements of the smaller companies would seem to make it easier for them to secure supplies than for the large companies to do so, but even for the smaller companies it is not altogether a matter of ingenuity in making purchases. They, too, can only hope to go along, living from hand to mouth, as it were, while the operators and the miners bicker.

It is possible for the most part only to generalize about the coal situation. Everybody and every section is suffering, but the degree of the suffering is tempered by many different elements. It can not be said that all New York is suffering from the shortage more than is New England or that Michigan is worse off than Illinois. In other words, the degree of suffering can not be reduced to geographical or political divisions and sub-divisions. Thus in one of the largest cities of the country one large system is fairly well fortified for the immediate future by supplies of coal on hand and others in prospect, while another company is only a few days removed from the curtailment of service and possible shut down of some lines.

Railway operators reading this account will say it is a tale of woe. It is. Some of it is not new. It would, indeed, be a pleasure to be able to say what prospects are ahead, but there is no one that knows. Statistics show that increasingly more coal is being mined and that the non-union fields are in the position to produce record tonnage. Moreover, Mr Hoover says that a large percentage of coal operators have continued to sell coal at the agreed price when they could have had $8 or $10 for the asking. He is outspoken in his praise of these operators. All this, however, is only provocation to the operator who sees his supply of coal on hand constantly diminishing or has been gouged by one of the unscrupulous or so-called bootleggers in coal. And it does him little good to know that the House has passed a bill for an impartial investigation of the coal industry and that the Senate is expected to pass the bill within a few days. What could anybody predict of a definite nature about the outcome of a situation in which politics, chicanery and greed are mixed to the extent that these elements are blended in the coal and railroad crisis? One measure of satisfaction remains for the utility operators, however, in the knowledge that the case of the utilities is being brought before the authorities at Washington with all the resources that the national bodies representing the electric railway, gas and power industries can command.

As for the settlement at Cleveland there is little blinking the fact that both sides regard it as merely a truce, with each of the contestants retaining their arms and preparing for a resumption of hostilities on a larger scale. Thus is the gloom thickened, but it is a warning that may well be heeded for the future. It is the opinion in Washington—almost unanimously held—that all the operators eventually will accept the Cleveland agreement. So far as the Government

officials are concerned, they will have little patience with any other course. Their position is that the public's need of coal is more important at this time than any issue involved in the strike. In Washington the viewpoint of Government officials and members of the Congressional bodies is regarded as important, not so much from any law the Government can invoke, but from the fact that they are assured complete publicity for their sentiments on this subject and in that way can crystallize public opinion. Whether or not one agrees with the degree of optimism thus expressed about the power of public opinion in this particular instance will probably vary inversely with his real knowledge of the present temper of the operators and the miners.

Car Building Increases

Operations at car building plants of the J. G. Brill Company have been steadily increasing since the early months of the year and are now on a larger basis than at any time since the slump following termination of the war.

Orders have been coming in fairly regularly of late, and while a good portion of this has been in small lots, a number of large contracts have been taken. In addition to demand for new equipment the company reports a comfortable business in replacements. There has been a good demand for trucks all along, an evidence of the economies being practised by railways in getting the most service out of their equipment.

The company reports a steady demand for its "Birney" safety car. It has been the practice to build cars of this type for stock, about two-thirds complete, in anticipation of demand. Recently, however, construction work has not kept much ahead of orders.

Opportunity for Forehanded Buyers

Increases in wages in the steel industry to become effective Sept. 1 and the imminent prospect of higher coal costs are likely to be reflected in increases in electric railway equipment costs in the near future. It appears that prospective buyers will do well to consider this with a view to placing orders now for contemplated later purchases.

Metal, Coal and Material Prices

Metals—New York	Aug. 22, 1922
Copper, electrolytic, cents per lb	13.975
Copper wire base, cents per lb	15.625
Lead, cents per lb	5.925
Zinc, cents per lb	6.575
Tin, Straits, cents per lb	32.50
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$8.725
Somerset mine run, Boston, net tons	8.00
Pittsburgh mine run, Pittsburgh, net tons	.....
Franklin,Ill.,screenings,Chicago,net tons	.....
Central, Ill., screenings, Chicago, net tons	.....
Kansas screenings, Kansas City, net tons	.....
Materials	
Rubber-covered wire, N. Y., cents per lb.	6.05
Weatherproof wire base,N.Y.,cents per lb.	16.00
Cement, Chicago net prices, without bags	$2.05
Linseed oil (5-bbl.lots), N.Y.,cents per gal.	91.50
White lead,(100-lb.keg),N.Y.,cents per lb.	12.50
Turpentine, (bbl. lots), N.Y., per gal.	$1.30

Rolling Stock

Clinton, Davenport & Muscatine Railway, Davenport, Ia., is contemplating the purchase of six double-truck interurban cars.

Eastern Wisconsin Electric Company, Oshkosh, Wis., recently placed an order with the St. Louis Car Company for five interurban cars to be used on the lines between the cities of Oshkosh and Fond du Lac.

Boston (Mass.) Elevated Railway has overhauled and painted since Jan. 1 of this year 491 cars, as compared with 282 during the same period last year.

Track and Roadway

San Diego & Arizona Railway, San Diego, Cal., has received permission from the California Railroad Commission to construct an industrial track at grade across Twenty-third and Twenty-fourth Streets in National City, San Diego County.

Indiana Service Corporation Fort Wayne, Ind., has requested the Board of Public Works for a franchise for double switch curve connections at West Creighton Avenue and Calhoun Street and also for a twelve block extension on Wells Street.

Northern Texas Traction Company, Fort Worth, Tex., is just finishing the work of laying new steel on its South Main Street line in connection with the paving of this street with asphalt over a concrete base. The company is paving between its tracks.

Southwestern Traction Company, Temple, Tex., is committed to the construction of an interurban line from Rosen Heights, a suburb of the city of Fort Worth, Tex., to Lake Worth, the city's bathing and summer resort, 10 miles distant. Surveyors are in the field, according to Henry Hutchings, first vice-president of the company. It is announced that as soon as the survey is completed and estimates and specifications prepared, active construction work will begin. The right of way has been secured, and all permits in connection with the building of the line granted. The line will run down the center of the nine-mile bridge road to a point west of the old aviation hangar, and will then turn to the left and proceed directly to the lake. A loop will be run past the Southwest Motor Club's clubhouse to the dam, then back toward Arlington Heights.

Power Houses, Shops and Buildings

New Brunswick Power Company, St. John, N. B., is installing a new turbine in the St. John power plant.

The Pine Pluff (Ark.) Company and the Arkansas Light & Power Company have moved into their new home recently erected in that city at 411-13 Main Street. The firms have been located at 512 Main Street.

Indiana, Columbus & Eastern Traction Company, Springfield, Ohio, has completed the work of installing the necessary new equipment at power substations for use of 60-cycle current. Heretofore the line has been using 25-cycle energy furnished by its own power houses, but some time back an agreement was reached with the Dayton Power & Light Company to supply 60-cycle current, and the work of making the necessary change in equipment was started at once.

Trade Notes

A. A. Murphy has been appointed resident sales manager of the Industrial and Railway Paint and Varnish Division of the du Pont company, with headquarters in New York City. He will be located at the new office of the Paint and Varnish Division, 30 Church Street. Mr. Murphy has been with the du Pont company for many years and is an experienced paint and varnish man.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., announces that a second large shipment of railway material for the electrification of the Chilean State Railways was made recently. The train consisting of thirty-three cars was started from the East Pittsburgh works by wireless. E. M. Herr, president of the company, closed a switch on a pole near the train and this reacted to the wireless circuit on the locomotive, releasing the controller and causing locomotive to start.

New Advertising Literature

Quigley Fuel Systems, Inc., New York, N. Y., has just issued bulletin A, giving a condensed description of the Quigley powdered coal system and appliances. The layout of a typical coal mining plant is shown and the method of fuel distribution and control briefly described.

St. Louis Car Company, St. Louis, Mo., has issued bulletin 100 on electric car specialties. This includes manually operated folding door and step mechanism, sash fixtures, window guards and fasteners, grab handles, gongs, seats and seat handles, curtains, fare boxes, ventilators, etc.

Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., has recently issued a leaflet describing arc splitters for controllers. The life of a controller is dependent to a large extent upon the design of the magnetic blowout which is used for rupturing the arc that is established when the controller contacts are separated under load. Arc splitters assist in rupturing the arc by cooling it and also by causing it to form two or more loops which have a total length within a given magnetic field that is much greater than the length of a single loop.